United States
Department of
Agriculture

Natural Resources
Conservation
Service

# Oregon
# Basin Outlook Report

## May 1, 2022

**Brock Phillips, USBR Physical Scientist, prepares to take a snow core sample along the Park H.Q. Snow Course in Crater Lake National Park. Snowpack at the site was 69% of median.**
*(Photo taken April 28,2022: Chris Gebauer, NRCS Soil Scientist)*

**April was a much wetter and cooler month after record to near-record dry and warm conditions from early January into early April. Storm impacts in mid-April brought additional snow accumulation across the state, delaying snowpack melt-out in the northwest and parts of northeast Oregon. In contrast, areas of southern Oregon and east of the Cascades, the storm impacts were not enough to significantly offset early season snowpack deficits and early snow melt-out. The outlook in these areas will be dominated by surface water supply shortages and drought impacts through the remainder of the year.**

# Contents

# General Outlook

**May 1st, 2022**

## SUMMARY

Despite a wetter and cooler April, long-term precipitation deficits continue to remain stable or have increased for most major basins, leading to a continuation of drought conditions throughout much of Oregon. The exception is in the northwest, where drought conditions have improved significantly over the last 3 months due to above median precipitation and near to above median snowpack for much of winter. In southwestern Oregon and areas east of the Cascades in central and southeastern Oregon, late season snow accumulation was not enough to offset early season snowpack deficits and early rapid melt-out in several areas. The early melt-out, in combination with snowpack peaking at levels significantly below the 1991-2020 median peak resulted in an adverse outlook for water supply availability during the summer. In impacted regions, the additional snowmelt runoff contribution to streamflow volumes is well-below median. Therefore, preparations should be taken for surface and ground water supply shortages during summer in these regions.

Due to multi-year impacts, extensive drought is forecasted to persist in much of Oregon throughout summer. Current drought conditions include nearly 90% of the state in some drought category according to the National Drought Monitor, with approximately 69% of the state in D2 (severe) to D4 (exceptional) drought categories.

The three-month outlook from the NOAA Climate Prediction Center calls for elevated chances of below normal precipitation, and elevated chances of above normal temperatures for areas east of the Cascade crest in Oregon.

## SNOWPACK

Snowpack varied across the state. For several basins, additional snow accumulation was not enough to offset early-season snowpack deficits and early melt-out. Peak snowpack in the John Day and Malheur Basins was well below their typical median peak, with the late snow only pausing the early rapid melt-out that began in March. These conditions are widespread across the state and include other basins in central, southern and parts of northeastern Oregon. In contrast, for sites at high elevations in the northern Oregon Cascades and the extreme northern Blue Mountains, additional snow accumulation delayed peak snowpack and the onset of melt-out due to cooler temperatures. Additionally, those areas received the most beneficial snow accumulation and precipitation during the series of storms in April.

The lowest May 1st snowpack is 19% of median in the Malheur Basin, and the highest is 173% in the Hood, Sandy, and Lower Deschutes Basin. Other basins range from 46% (Lake County and Goose Lake Basin) to 118% (Willamette Basin).

## PRECIPITATION

Although monthly precipitation is well-above median for nearly all basins in Oregon, water-year precipitation is still below to near median for most basins. Long-term precipitation deficits, notably in the last 2-3 years, continue to grow or remain stable for most basins, as evident by

several sites in southern and central Oregon recording their driest or 2nd driest 2.5 years on record (Figure 1). However, the precipitation deficit for much of northwestern Oregon has been alleviated due in part to that area receiving most storm impacts.

The lowest water-year precipitation for May 1st is 75% of median in the Malheur Basin, and the highest is 103% in the Hood, Sandy, and Lower Deschutes Basin. Other basins range from 77% (Rogue and Umpqua Basin and Klamath Basin) to 97% (Umatilla, Walla Walla and Willow Basin).

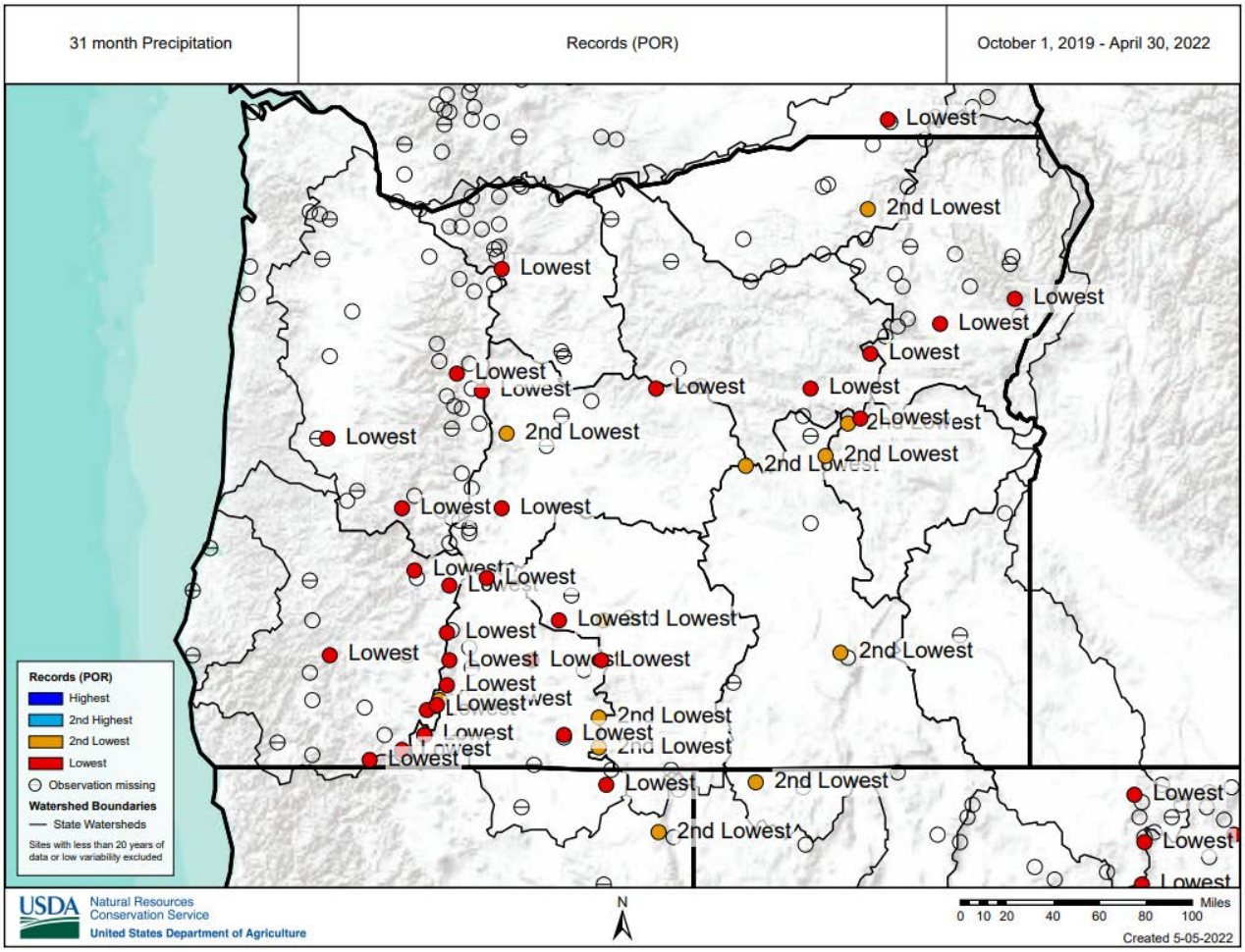



**Figure 1**: Records for 31-month (2.5 years) precipitation at SNOTEL sites in Oregon.

## RESERVOIRS

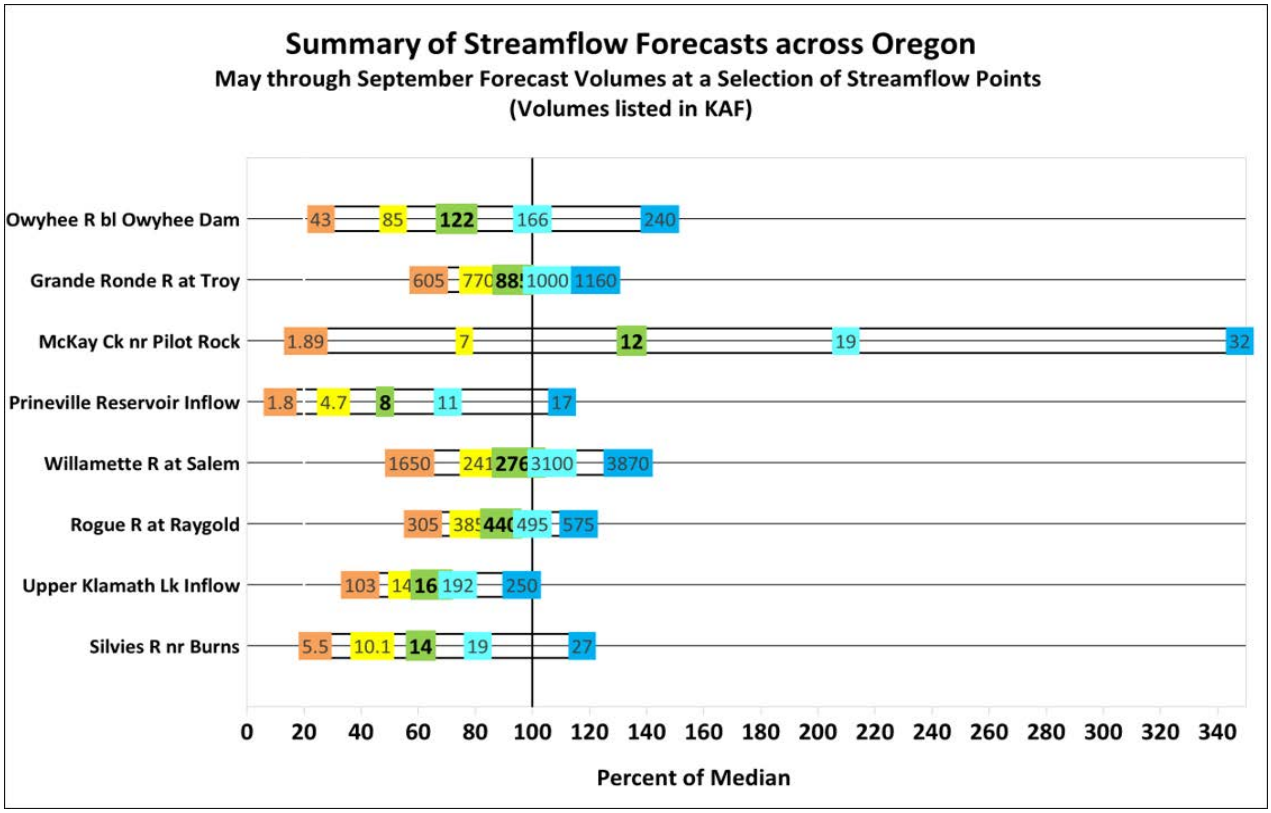
Reservoir storage volumes vary across the state as of May 1st. Several reservoirs in the Willamette Basin saw improvements in volumetric storage with most storing volumes near median. Storage volumes vary in northeastern Oregon from well-below to above median. Reservoirs in central and southern Oregon are storing volumes below to well-below median. Reservoir operators control for a variety of factors when choosing to store or release water, including flooding, irrigation, fisheries, and other water supply needs.

## STREAMFLOW

Streamflow conditions vary across the state. Streamflow volumes in southwestern Oregon have increased as percent median due to snowmelt runoff and widespread precipitation. In parts of northeastern and northwestern Oregon, several gaging stations decreased as percent of median

on May 1st compared to April 1st, reflecting in part a delay in peak snowpack at higher elevations in those regions. Several gauge stations in central and southeastern Oregon are recording streamflow volumes well-below median.

As of May 1st, there have been modest increases in streamflow forecasts across the state due to wetter conditions in all basins during April. The above median outlook for much of the northwest is indicative of the significant drought recovery in that region over the last 3 months. In other basins, despite moderately improved outlooks, the continued forecasted deficits in volumetric streamflow hamper the potential for meaningful drought recovery, notably in central and southern Oregon. As summer approaches, temperature—for its effect both on the timing/rate of snowpack melt-out and evaporative demand—will be a dominant factor in further shaping the outlook for summer streamflow and drought conditions.




| Legend: | ←----------Drier----------**Future Conditions**----------Wetter----------→ | | | |
|---|---|---|---|---|
| **90% Exceedance Forecast (KAF)** There is a 90% chance that flows will exceed this volume. | **70% Exceedance Forecast (KAF)** There is a 70% chance that flows will exceed this volume. | **50% Exceedance Forecast (KAF)** There is a 50% chance that flows will exceed this volume. | **30% Exceedance Forecast (KAF)** There is a 30% chance that flows will exceed this volume. | **10% Exceedance Forecast (KAF)** There is a 10% chance that flows will exceed this volume. |

To accompany the forecast summary graphic above, here are some helpful reminders about interpreting streamflow forecasts published in this document. For each forecast point, five possible streamflow volumes are predicted. Where the observed streamflow occurs within this spectrum depends on the range of future weather conditions. If water users wish to plan conservatively, they may lean toward using the 70% chance of exceedance forecast, or the drier forecast. Conversely, if a water user believes future conditions will provide more water to the system, they could choose to use the 30% chance of exceedance forecast (the wetter forecast). These arrays of forecasts are shown in the chart above and explained in more detail at the end of this document.

All forecasts are listed with units of 1000 acre-feet (KAF). This report contains data furnished by the Oregon Department of Water Resources, U.S. Geological Survey, NOAA National Weather Service, and other cooperators. This report will be updated monthly, January through June.

## UPDATED 1991-2020 NORMALS

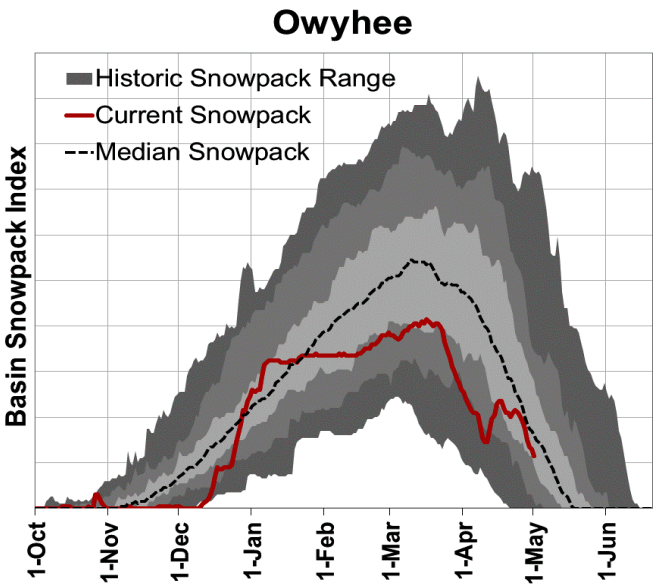
The normals for the Snow Survey and Water Supply Forecasting Program are site-specific measures of central tendency (either median or average) for a data type, such as snow water equivalent (SWE). The statistics are calculated over a 30-year period and updated each decade, in agreement with standards set by the World Meteorological Organization (WMO). This 30-year reference period was chosen to characterize the current hydroclimatology at each station. The most recent medians and averages have been updated to include data for the water years 1991-2020. The National Water and Climate Center (NWCC) also provides medians and averages for the 1981-2010 and 1971-2000 reference periods for stations with sufficient data.

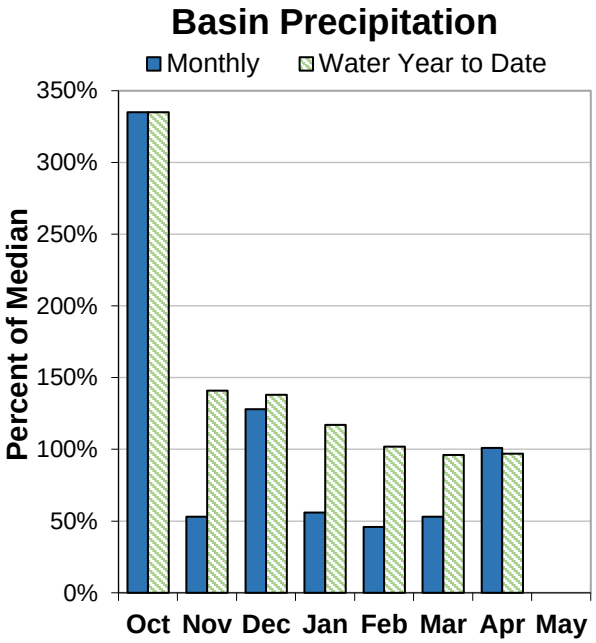
For the 1991-2020 reference period, the median is the official NRCS normal when conveying information about current snowpack, precipitation, and water supply conditions. The median was previously used as the official 1981-2010 normal for SWE and some streamflow forecast points, but the average was used for other data types. Setting the official normal to the median provides consistency across data types and stations. In addition, the median is a better indicator of central tendency because anomalous data has less effect on measurement distributions. Viewing the 30-year average may be preferable over the median in some instances; therefore, both the average and the median are available in most NRCS reports and products.

For more information regarding updated 1991-2020 normals, please visit the National Water and Climate Center's webpage.

# Owyhee Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 75% of median. This is higher than last month when the basin snowpack was 50% of median.

### PRECIPITATION

April precipitation was 100% of median. Precipitation since the beginning of the water year (October 1 - May 1) has been 97% of median.

### RESERVOIR

Reservoir storage across the basin is currently well below median. As of May 1, storage at Lake Owyhee Reservoir is 65% of median.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 77% to 81% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well below median streamflows this spring and summer.

# Owyhee Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Owyhee R nr Rome | MAY-JUL | 14 | 44 | 75 | 66% | 114 | 186 | 113 |
| | MAY-SEP | 19 | 52 | 85 | 67% | 125 | 199 | 126 |
| Owyhee R bl Owyhee Dam[2] | MAY-JUL | 27 | 64 | 98 | 70% | 139 | 215 | 140 |
| | MAY-SEP | 43 | 85 | 122 | 73% | 166 | 240 | 166 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

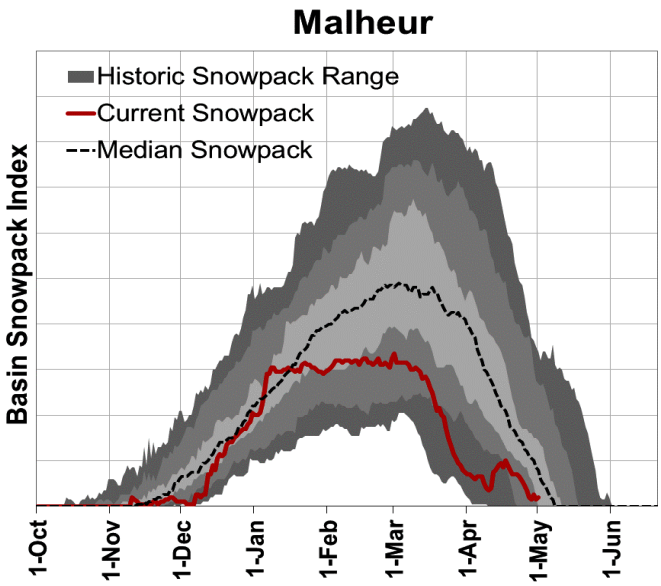
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Lake Owyhee | 327 | 407 | 502 | 65% | 715 |
| Wild Horse Reservoir | 41 | 55 | 41 | 100% | 72 |

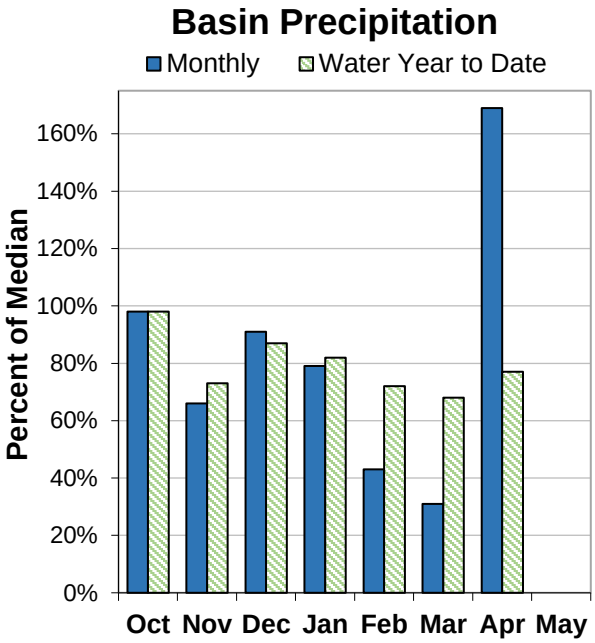
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Owyhee | 9 | 75% | 76% |
| Upper Owyhee | 5 | 53% | 57% |
| South Fork Owyhee | 5 | 71% | 60% |
| Middle Owhyee | 1 | 100% | 0% |
| Jordan | 3 | 78% | 89% |
| East Little Owyhee | 0 | | |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Jacks Peak | SNOTEL | 8424 | 48 | | | | |
| Toe Jam | SNOTEL | 7690 | 7 | 4.6 | 0.7 | 1.2 | 657% |
| Jack Creek Upper | SNOTEL | 7377 | 20 | 7.1 | 13.4 | 10.3 | 53% |
| Jack Creek, Lower | SC | 7125 | | | | | |
| Dobson Creek | SC | 7093 | 55 | 20.4 | 26.5 | 24.9 | 77% |
| Fawn Creek | SNOTEL | 7031 | 16 | 5.5 | 10.2 | 3.2 | 54% |
| Merritt Mountain - Aerial Marker | SC | 6915 | | | | | |
| Merritt Mountain | SNOTEL | 6915 | 0 | | | | |
| Big Bend | SNOTEL | 6898 | 0 | 0.0 | 0.0 | 0.0 | |
| Fry Canyon | SNOTEL | 6798 | 0 | 0.0 | | 0.0 | |
| Fry Canyon | SC | 6700 | | | | | |
| Gold Creek | SC | 6695 | | | | | |
| Laurel Draw | SNOTEL | 6682 | 0 | 0.0 | 0.0 | 0.0 | |
| Red Canyon AM | SC | 6600 | 0 | 0.0 | | 0.0 | |
| Louse Canyon AM | SC | 6530 | 0 | 0.0 | | 0.0 | |
| South Mtn. | SNOTEL | 6500 | 2 | 1.5 | 1.5 | 0.0 | 100% |
| Columbia Basin | SNOTEL | 6483 | 0 | | | | |
| Columbia Basin - Aerial Marker | SC | 6483 | | | | | |
| Taylor Canyon | SNOTEL | 6325 | 0 | 0.0 | 0.0 | 0.0 | |
| Succor Creek AM | SC | 6310 | | | | | |
| Quinn Ridge AM | SC | 6270 | 0 | 0.0 | | 0.0 | |
| Vaught Ranch AM | SC | 5850 | 0 | 0.0 | | 0.0 | |
| Lookout Butte AM | SC | 5740 | 0 | 0.0 | | 0.0 | |
| Mud Flat | SNOTEL | 5730 | 0 | 0.0 | 0.0 | 0.0 | |
| Battle Creek AM | SC | 5710 | 0 | 0.0 | | 0.0 | |
| Bull Basin AM | SC | 5460 | 0 | 0.0 | | 0.0 | |

# Malheur Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 25% of median. This is slightly higher than last month when the basin snowpack was 21% of median.

### PRECIPITATION

April precipitation was 169% of median. Precipitation since the beginning of the water year (October 1 - May 1) has been 77% of median.

### RESERVOIR

Reservoir storage across the basin is currently well below median. As of May 1, storage at major reservoirs in the basin ranges from 25% of median at Warm Springs Reservoir to 61% of median at Bully Creek Reservoir.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 35% to 58% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

# Malheur Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| NF Malheur R at Beulah[2] | MAY-JUL | 2 | 7 | 14 | 51% | 20 | 30 | 27 |
| | MAY-SEP | 2 | 12 | 19 | 58% | 26 | 36 | 32 |
| Malheur R nr Drewsey | MAY-JUL | 1 | 4 | 8 | 34% | 13 | 22 | 24 |
| | MAY-SEP | 1 | 5 | 9 | 35% | 14 | 23 | 25 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

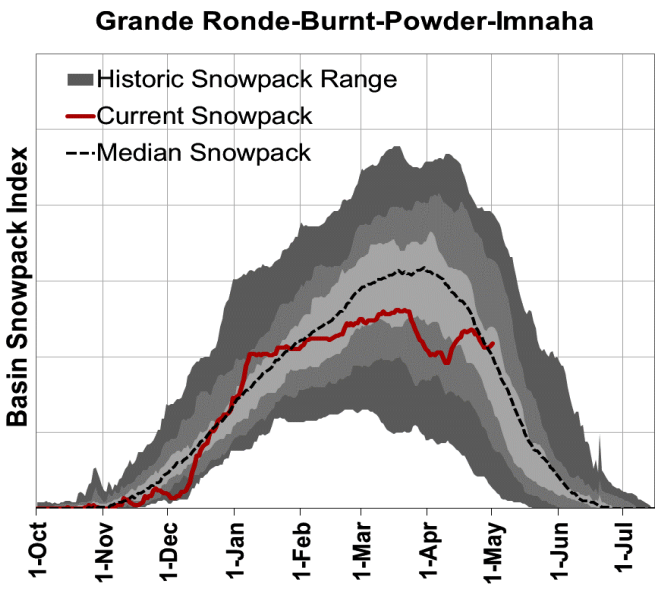
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Beulah | 28 | 37 | 49 | 57% | 59 |
| Warm Springs | 29 | 79 | 117 | 25% | 170 |
| Bully Creek | 14 | 21 | 24 | 61% | 24 |

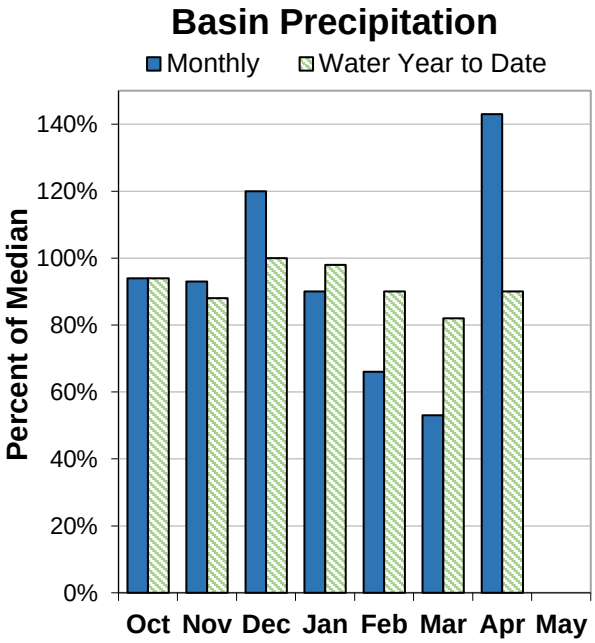
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Malheur | 3 | 25% | 0% |
| Willow-Malheur | 0 | | |
| Upper Malheur | 3 | 25% | 0% |

| Basin Snowpack Measurement Sites | | | | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | Network | Elevation (ft) | Snow Depth (in) | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Blue Mountain Spring | SNOTEL | 5870 | 1 | 1.2 | 4.8 | 0.0 | 25% |
| Barney Creek (New) | SC | 5830 | 1 | 0.5 | | 0.0 | |
| Buck Pasture AM | SC | 5740 | | | | | |
| Boulder Creek AM | SC | 5710 | | | | | |
| Call Meadows AM | SC | 5380 | 0 | 0.0 | | 0.0 | |
| Bully Creek AM | SC | 5300 | | | | | |
| Rock Springs | SNOTEL | 5290 | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. | SNOTEL | 5240 | 0 | 0.0 | 0.0 | 0.0 | |
| Flag Prairie AM | SC | 4720 | | | | | |
| Eldorado Pass | SC | 4630 | | | | | |

# Grande Ronde, Powder, Burnt and Imnaha Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 105% of median. This is significantly higher than last month when the basin snowpack was 64% of median.

### PRECIPITATION

April precipitation was 144% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 90% of median.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 17% of median at Phillips Lake to 121% of median at Wallowa Lake.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 59% to 93% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect below median to well below median streamflows this spring and summer.

# Grande Ronde-Burnt-Powder-Imnaha Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Catherine Ck nr Union | MAY-JUL | 30 | 36 | 40 | 85% | 44 | 50 | 47 |
| | MAY-SEP | 33 | 39 | 44 | 85% | 48 | 54 | 52 |
| Powder R nr Sumpter[2] | MAY-JUL | 16 | 22 | 26 | 84% | 30 | 37 | 31 |
| | MAY-SEP | 17 | 22 | 26 | 81% | 30 | 37 | 32 |
| Pine Ck nr Oxbow | MAY-JUL | 60 | 78 | 90 | 78% | 102 | 120 | 115 |
| | MAY-SEP | 64 | 82 | 94 | 79% | 107 | 125 | 119 |
| Lostine R nr Lostine | MAY-JUL | 76 | 84 | 89 | 88% | 95 | 102 | 101 |
| | MAY-SEP | 81 | 90 | 96 | 89% | 102 | 111 | 108 |
| Grande Ronde R at Troy | MAY-JUL | 540 | 700 | 810 | 93% | 920 | 1080 | 870 |
| | MAY-SEP | 605 | 770 | 885 | 93% | 1000 | 1160 | 950 |
| Burnt R nr Hereford[2] | MAY-JUL | 2 | 4 | 6 | 56% | 9 | 13 | 12 |
| | MAY-SEP | 3 | 5 | 7 | 59% | 10 | 15 | 12 |
| Imnaha R at Imnaha | MAY-JUL | 91 | 121 | 141 | 76% | 161 | 191 | 186 |
| | MAY-SEP | 104 | 135 | 156 | 76% | 178 | 210 | 205 |
| Bear Ck nr Wallowa | MAY-JUL | 34 | 43 | 49 | 92% | 54 | 63 | 53 |
| | MAY-SEP | 37 | 45 | 51 | 93% | 57 | 65 | 55 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

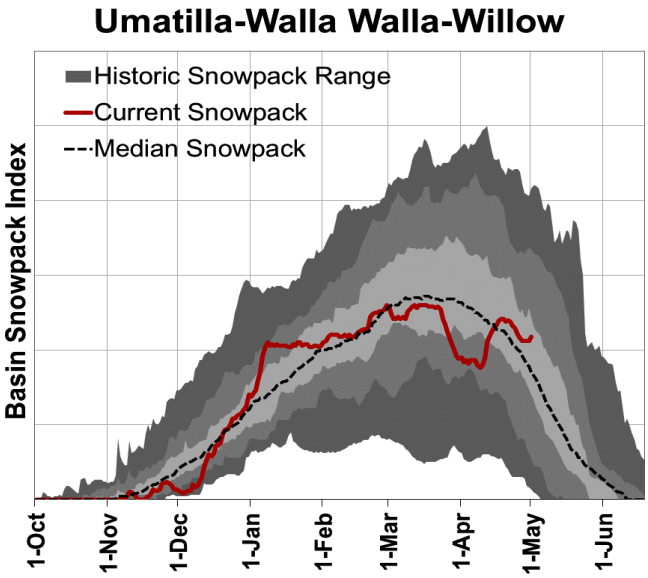
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Unity | 21 | 25 | 24 | 85% | 26 |
| Brownlee Reservoir | 1140 | 959 | 1148 | 99% | 1420 |
| Wallowa Lake | 25 | 21 | 21 | 121% | 38 |
| Phillips Lake | 8 | 16 | 45 | 17% | 74 |
| Wolf Creek | 4 | 7 | 10 | 44% | 11 |
| Thief Valley | 13 | 13 | 14 | 96% | 13 |

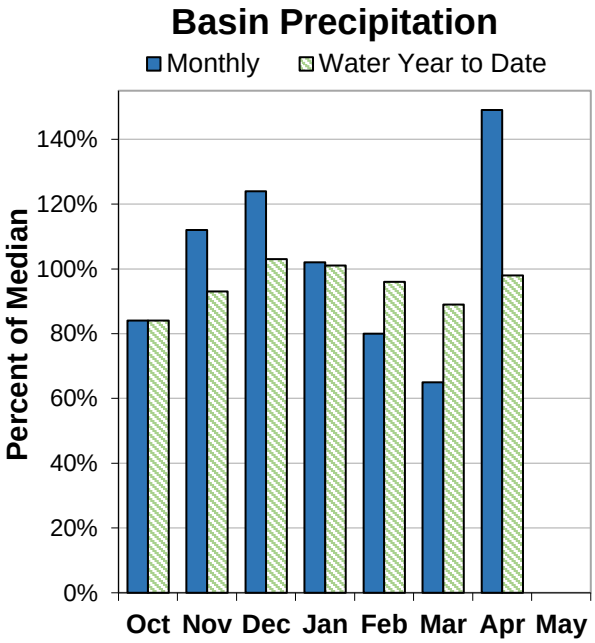
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Grande Ronde-Burnt-Powder-Imnaha | 23 | 105% | 83% |
| Wallowa | 6 | 93% | 72% |
| Upper Grande Ronde | 9 | 112% | 101% |
| Powder | 8 | 100% | 83% |
| Lower Grande Ronde | 4 | 107% | 72% |
| Imnaha | 4 | 96% | 73% |
| Burnt | 2 | 277% | 246% |
| Brownlee Reservoir | 2 | 111% | 108% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Mirror Lake AM | SC | 8120 | | | | | |
| Mt. Howard | SNOTEL | 7910 | 52 | 18.9 | 17.8 | 9.5 | 106% |
| Aneroid Lake #2 | SNOTEL | 7400 | 58 | 18.5 | 25.0 | 12.6 | 74% |
| Standley AM | SC | 7360 | | | | | |
| Anthony Lake (Rev) | SC | 7160 | 64 | 25.5 | 28.0 | 23.8 | 91% |
| Tv Ridge AM | SC | 7050 | 40 | 13.3 | 19.0 | 9.2 | 70% |
| Bald Mtn Am OR | SC | 6600 | 56 | 21.3 | 19.6 | 24.0 | 109% |
| Little Alps | SC | 6360 | | | | | |
| Big Sheep AM | SC | 6230 | 54 | 21.4 | 19.2 | 18.3 | 111% |
| Bear Saddle | SNOTEL | 6180 | 36 | 13.4 | 10.4 | 12.6 | 129% |
| Bourne | SNOTEL | 5850 | 9 | 4.5 | 3.0 | 1.6 | 150% |
| Barney Creek (New) | SC | 5830 | 1 | 0.5 | | 0.0 | |
| Placer Creek | SC | 5794 | | | | | |
| Moss Springs | SNOTEL | 5760 | 52 | 23.0 | 19.6 | 17.4 | 117% |
| Taylor Green | SNOTEL | 5740 | 13 | 7.9 | 10.2 | 7.4 | 77% |
| Boulder Creek AM | SC | 5710 | | | | | |
| Spruce Springs | SNOTEL | 5700 | 18 | 9.0 | 4.8 | 0.0 | 188% |
| Wolf Creek | SNOTEL | 5630 | 31 | 5.3 | 7.0 | 4.4 | 76% |
| Milk Shakes | SNOTEL | 5580 | 85 | 35.8 | 39.1 | 34.5 | 92% |
| Touchet | SNOTEL | 5530 | 57 | 25.9 | 22.3 | 13.3 | 116% |
| Eilertson Meadows | SNOTEL | 5510 | 0 | 0.6 | 0.0 | 0.0 | |
| West Eagle Meadows AM | SC | 5500 | 32 | 15.7 | | 17.3 | |
| Dooley Mountain | SC | 5440 | | | | | |
| Gold Center | SNOTEL | 5410 | 0 | 0.2 | 0.0 | 0.0 | |
| Schneider Meadows | SNOTEL | 5400 | 37 | 16.7 | 16.7 | 16.7 | 100% |
| Beaver Reservoir | SNOTEL | 5150 | 10 | 3.9 | 0.0 | 0.0 | |
| Tipton | SNOTEL | 5150 | 7 | 3.4 | 1.3 | 3.2 | 262% |
| Thorson Cabin #2 | SC | 5125 | | | | | |
| High Ridge | SNOTEL | 4920 | 48 | 21.6 | 12.2 | 20.7 | 177% |
| County Line | SNOTEL | 4830 | 0 | 0.0 | 0.0 | 0.0 | |
| Eldorado Pass | SC | 4630 | | | | | |
| Little Antone (Alt.) | SC | 4560 | | | | | |
| Bowman Springs | SNOTEL | 4530 | 0 | 0.0 | 0.0 | 0.0 | |
| East Eagle | SC | 4400 | | | | | |
| Sourdough Gulch | SNOTEL | 4000 | 0 | 0.0 | 0.0 | 0.0 | |

# Umatilla, Walla Walla and Willow Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 125% of median. This is significantly higher than last month when the basin snowpack was 72% of median.

### PRECIPITATION

April precipitation was 149% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 98% of median.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 61% of median at Cold Springs Reservoir to 102% of median at Willow Creek.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 100% to 135% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well above median to near median streamflows this spring and summer.

# Umatilla-Walla Walla-Willow Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Mill Ck nr Walla Walla | MAY-JUL | 8 | 12 | 14 | 104% | 17 | 21 | 14 |
| | MAY-SEP | 12 | 15 | 18 | 103% | 20 | 24 | 17 |
| SF Walla Walla R nr Milton-Freewater | MAY-JUL | 28 | 34 | 38 | 100% | 42 | 48 | 38 |
| | MAY-SEP | 41 | 47 | 51 | 100% | 55 | 61 | 51 |
| Willow Ck ab Willow Ck Lake nr Heppner | MAY-JUL | 1 | 3 | 4 | 129% | 6 | 9 | 4 |
| | MAY-SEP | 2 | 3 | 5 | 134% | 6 | 10 | 4 |
| Umatilla R at Pendleton | MAY-JUL | 35 | 67 | 89 | 129% | 111 | 144 | 69 |
| | MAY-SEP | 39 | 72 | 94 | 127% | 116 | 149 | 74 |
| McKay Ck nr Pilot Rock | MAY-JUL | 2 | 7 | 12 | 133% | 19 | 32 | 9 |
| | MAY-SEP | 2 | 7 | 12 | 135% | 19 | 32 | 9 |
| Butter Ck nr Pine City | MAY-JUL | 2 | 4 | 6 | 117% | 8 | 11 | 5 |
| | MAY-SEP | 2 | 4 | 6 | 120% | 8 | 11 | 5 |
| Rhea Ck nr Heppner | MAY-JUL | 2 | 3 | 4 | 127% | 6 | 8 | 3 |
| | MAY-SEP | 2 | 3 | 5 | 128% | 6 | 9 | 4 |
| Umatilla R ab Meacham Ck nr Gibbon | MAY-JUL | 23 | 38 | 49 | 126% | 59 | 74 | 39 |
| | MAY-SEP | 28 | 43 | 54 | 120% | 64 | 80 | 45 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume

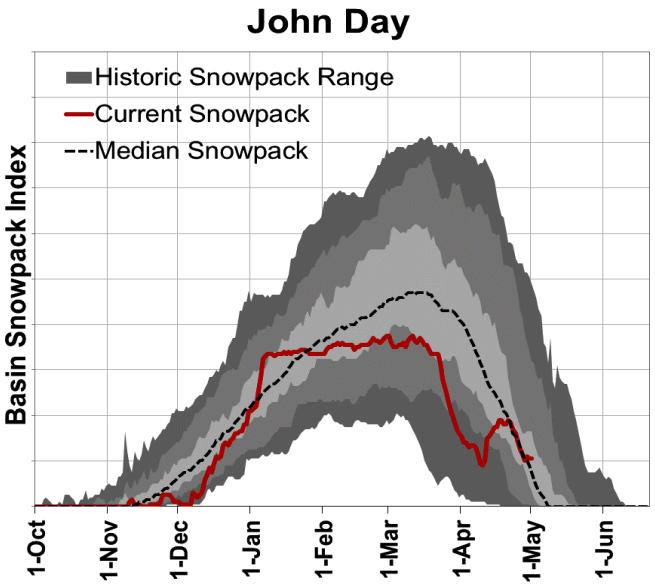
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Mckay | 60 | 63 | 64 | 93% | 72 |
| Cold Springs | 20 | 23 | 32 | 61% | 39 |
| Willow Creek | 6 | 6 | 6 | 102% | 10 |

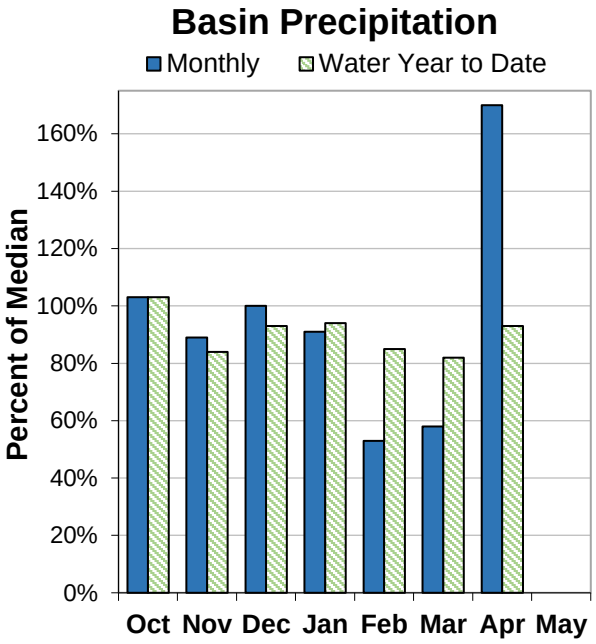
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Umatilla-Walla Walla-Willow | 10 | 125% | 83% |
| Willow | 2 | 212% | 28% |
| Walla Walla | 5 | 118% | 87% |
| Umatilla | 5 | 190% | 120% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Arbuckle Mtn | SNOTEL | 5770 | 33 | 14.2 | 6.7 | 1.9 | 212% |
| Spruce Springs | SNOTEL | 5700 | 18 | 9.0 | 4.8 | 0.0 | 188% |
| Milk Shakes | SNOTEL | 5580 | 85 | 35.8 | 39.1 | 34.5 | 92% |
| Touchet | SNOTEL | 5530 | 57 | 25.9 | 22.3 | 13.3 | 116% |
| Madison Butte | SNOTEL | 5150 | 0 | 0.0 | 0.0 | 0.0 | |
| Lucky Strike | SNOTEL | 4970 | 0 | 0.2 | 0.0 | 0.0 | |
| High Ridge | SNOTEL | 4920 | 48 | 21.6 | 12.2 | 20.7 | 177% |
| Bowman Springs | SNOTEL | 4530 | 0 | 0.0 | 0.0 | 0.0 | |
| Sourdough Gulch | SNOTEL | 4000 | 0 | 0.0 | 0.0 | 0.0 | |
| Emigrant Springs | SNOTEL | 3800 | 0 | 0.0 | 0.0 | 0.0 | |

# John Day Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 111% of median. This is significantly higher than last month when the basin snowpack was 42% of median.

### PRECIPITATION

April precipitation was 164% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 93% of median.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 73% to 125% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well above median to well below median streamflows this spring and summer.

# John Day Summary for May 1, 2022

## Forecast Exceedance Probabilities for Risk Assessment*

| Streamflow Forecasts | Forecast Period | <----Drier-----Future Conditions-----Wetter----> 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
|---|---|---|---|---|---|---|---|---|
| Strawberry Ck nr Prairie City | MAY-JUL | 3 | 5 | 6 | 75% | 6 | 8 | 7 |
| | MAY-SEP | 4 | 5 | 6 | 73% | 7 | 8 | 8 |
| NF John Day R at Monument | MAY-JUL | 108 | 210 | 275 | 80% | 345 | 445 | 345 |
| | MAY-SEP | 119 | 220 | 290 | 81% | 360 | 460 | 360 |
| Camas Ck nr Ukiah | MAY-JUL | 6 | 12 | 17 | 125% | 23 | 34 | 14 |
| | MAY-SEP | 6 | 12 | 18 | 125% | 24 | 35 | 14 |
| MF John Day R at Ritter | MAY-JUL | 18 | 39 | 54 | 75% | 68 | 90 | 72 |
| | MAY-SEP | 21 | 43 | 57 | 74% | 72 | 94 | 77 |

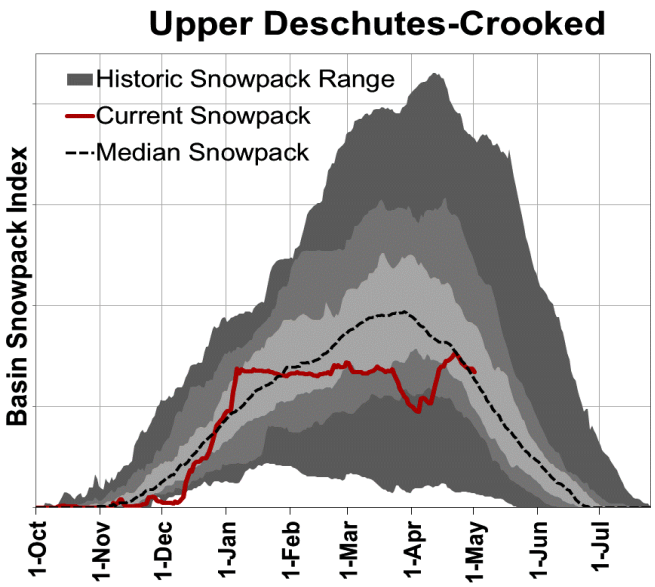
* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume

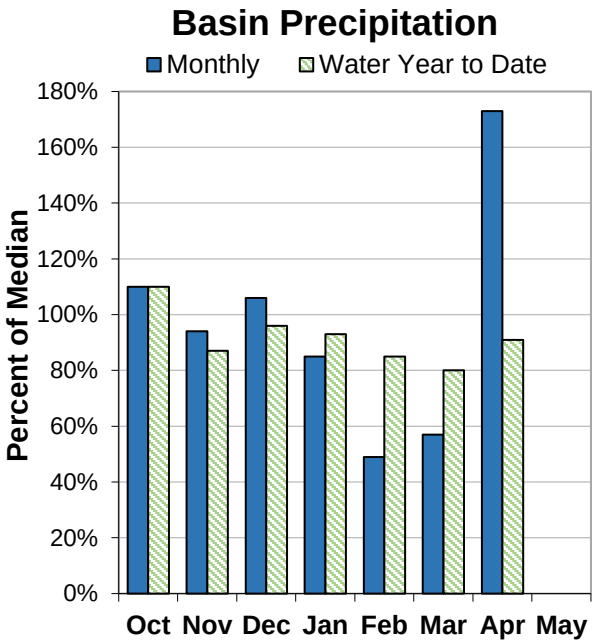
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| John Day | 15 | 111% | 65% |
| Upper John Day | 5 | 56% | 2% |
| North Fork John Day | 8 | 123% | 78% |
| Middle Fork John Day | 1 | 262% | 246% |
| Lower John Day | 3 | | |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
|---|---|---|---|---|---|---|---|
| Anthony Lake (Rev) | SC | 7160 | 64 | 25.5 | 28.0 | 23.8 | 91% |
| Little Alps | SC | 6360 | | | | | |
| Snow Mountain | SNOTEL | 6230 | 3 | 1.9 | 3.4 | 0.2 | 56% |
| Blue Mountain Spring | SNOTEL | 5870 | 1 | 1.2 | 4.8 | 0.0 | 25% |
| Derr | SC | 5860 | | | | | |
| Bourne | SNOTEL | 5850 | 9 | 4.5 | 3.0 | 1.6 | 150% |
| Derr. | SNOTEL | 5850 | 2 | 1.5 | 0.0 | 0.0 | |
| Arbuckle Mtn | SNOTEL | 5770 | 33 | 14.2 | 6.7 | 1.9 | 212% |
| Ochoco Meadows | SNOTEL | 5430 | 0 | 0.0 | 0.0 | 0.0 | |
| Gold Center | SNOTEL | 5410 | 0 | 0.2 | 0.0 | 0.0 | |
| Starr Ridge | SNOTEL | 5250 | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. | SNOTEL | 5240 | 0 | 0.0 | 0.0 | 0.0 | |
| Ochoco Meadows | SC | 5190 | | | | | |
| Madison Butte | SNOTEL | 5150 | 0 | 0.0 | 0.0 | 0.0 | |
| Tipton | SNOTEL | 5150 | 7 | 3.4 | 1.3 | 3.2 | 262% |
| Lucky Strike | SNOTEL | 4970 | 0 | 0.2 | 0.0 | 0.0 | |
| County Line | SNOTEL | 4830 | 0 | 0.0 | 0.0 | 0.0 | |
| Marks Creek | SC | 4580 | 0 | 0.0 | 0.0 | 0.0 | |

# Upper Deschutes and Crooked Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 106% of median. This is significantly higher than last month when the basin snowpack was 51% of median.

### PRECIPITATION

April precipitation was 172% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 91% of median.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 14% of median at Crescent Lake Reservoir to 103% of median at Crane Prairie Reservoir.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 44% to 90% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

# Upper Deschutes-Crooked Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Deschutes R at Benham Falls[2] | MAY-JUL | 177 | 194 | 205 | 91% | 215 | 235 | 225 |
| | MAY-SEP | 305 | 330 | 345 | 90% | 360 | 385 | 385 |
| Prineville Reservoir Inflow[2] | MAY-JUL | 2 | 4 | 7 | 42% | 10 | 16 | 17 |
| | MAY-SEP | 2 | 5 | 8 | 48% | 11 | 17 | 16 |
| Whychus Ck nr Sisters | MAY-JUL | 21 | 25 | 27 | 90% | 29 | 33 | 30 |
| | MAY-SEP | 30 | 34 | 37 | 90% | 40 | 44 | 41 |
| Crescent Lake Inflow[2] | MAY-JUL | 3 | 5 | 6 | 67% | 7 | 10 | 9 |
| | MAY-SEP | 2 | 3 | 5 | 51% | 6 | 9 | 9 |
| Ochoco Reservoir Inflow[2] | MAY-JUL | 2 | 2 | 3 | 38% | 4 | 4 | 8 |
| | MAY-SEP | 2 | 3 | 4 | 44% | 4 | 5 | 8 |
| Deschutes R bl Snow Ck | MAY-JUL | 10 | 14 | 16 | 74% | 19 | 23 | 22 |
| | MAY-SEP | 21 | 27 | 32 | 74% | 37 | 43 | 43 |
| Little Deschutes R nr La Pine[2] | MAY-JUL | 12 | 19 | 24 | 73% | 30 | 41 | 33 |
| | MAY-SEP | 10 | 17 | 23 | 68% | 30 | 41 | 34 |
| Crane Prairie Reservoir Inflow[2] | MAY-JUL | 22 | 29 | 33 | 75% | 37 | 44 | 44 |
| | MAY-SEP | 39 | 49 | 57 | 77% | 64 | 75 | 74 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

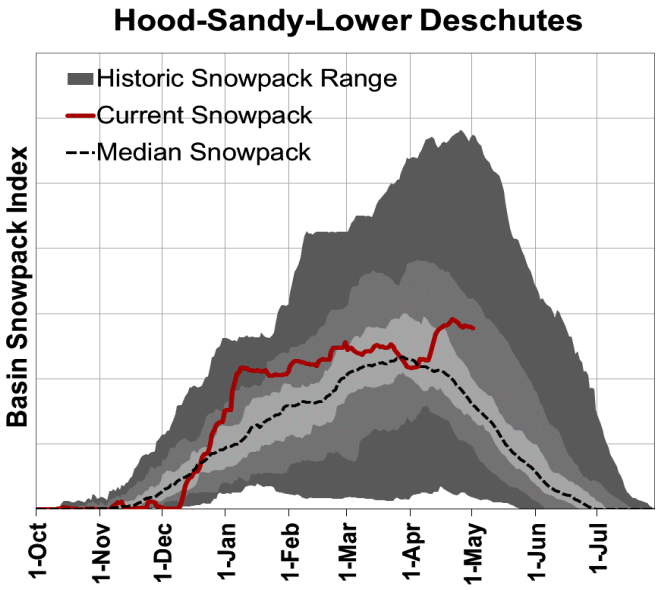
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Crescent Lake | 8 | 22 | 60 | 14% | 87 |
| Crane Prairie | 49 | 47 | 48 | 103% | 55 |
| Wickiup | 101 | 101 | 184 | 55% | 200 |
| Ochoco | 9 | 11 | 35 | 24% | 44 |
| Prineville | 42 | 90 | 148 | 28% | 149 |

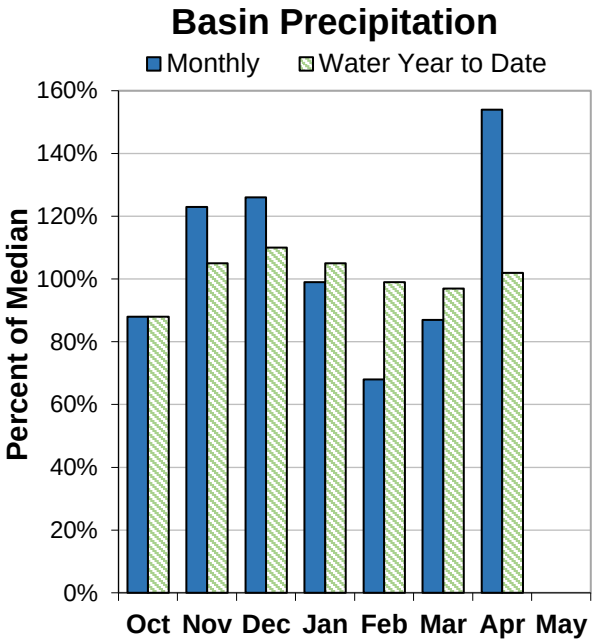
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Upper Deschutes-Crooked | 15 | 106% | 86% |
| Upper Deschutes | 10 | 106% | 72% |
| Upper Crooked | 3 | | |
| Lower Crooked | 2 | | |
| Little Deschutes | 4 | 99% | 87% |
| Beaver-South Fork | 1 | 56% | 6% |

| Basin Snowpack Measurement Sites | | | | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | Network | Elevation (ft) | Snow Depth (in) | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| New Dutchman #3 | SC | 6320 | | | 49.4 | | |
| Snow Mountain | SNOTEL | 6230 | 3 | 1.9 | 3.4 | 0.2 | 56% |
| Derr | SC | 5860 | | | | | |
| Derr. | SNOTEL | 5850 | 2 | 1.5 | 0.0 | 0.0 | |
| Three Creeks Meadow | SNOTEL | 5690 | 7 | 3.3 | 10.4 | 0.0 | 32% |
| Summit Lake | SNOTEL | 5610 | 87 | 36.4 | 40.4 | 34.9 | 90% |
| Bald Peter | SC | 5600 | | | 27.2 | 0.0 | |
| Irish Taylor | SNOTEL | 5540 | 80 | 30.2 | 32.8 | 30.2 | 92% |
| Tangent | SC | 5470 | | | 6.3 | | |
| Ochoco Meadows | SNOTEL | 5430 | 0 | 0.0 | 0.0 | 0.0 | |
| Ochoco Meadows | SC | 5190 | | | | | |
| Racing Creek | SC | 5160 | | | 9.4 | 0.0 | |
| Cascade Summit | SNOTEL | 5100 | 63 | 25.4 | 22.2 | 19.6 | 114% |
| Roaring River | SNOTEL | 4950 | 51 | 23.1 | 18.4 | 19.8 | 126% |
| New Crescent Lake | SNOTEL | 4910 | 0 | 0.0 | 0.0 | 0.0 | |
| Chemult Alternate | SNOTEL | 4850 | 0 | 0.0 | 0.0 | 0.0 | |
| Hogg Pass | SNOTEL | 4790 | 30 | 13.1 | 8.0 | 7.0 | 164% |
| Mckenzie | SNOTEL | 4770 | 79 | 34.6 | 32.5 | 27.3 | 106% |
| Marks Creek | SC | 4580 | 0 | 0.0 | 0.0 | 0.0 | |
| Hungry Flat | SC | 4400 | | | 0.0 | | |
| Salt Creek Falls | SNOTEL | 4220 | 37 | 18.9 | 10.3 | 13.7 | 183% |
| Santiam Jct. | SNOTEL | 3740 | 0 | 0.1 | 0.0 | 0.0 | |

# Hood, Sandy and Lower Deschutes Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 173% of median. This is significantly higher than last month when the basin snowpack was 95% of median.

### PRECIPITATION

April precipitation was 148% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 102% of median.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 100% to 121% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well above median to near median streamflows this spring and summer.

# Hood-Sandy-Lower Deschutes Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Hood R at Tucker Bridge | MAY-JUL | 147 | 168 | 183 | 128% | 197 | 220 | 143 |
| | MAY-SEP | 186 | 210 | 225 | 121% | 240 | 265 | 186 |
| Columbia R at The Dalles-NWS[2] | MAY-JUL | 59500 | | 66900 | 99% | | 76300 | 67400 |
| | MAY-SEP | 71600 | | 81000 | 100% | | 93000 | 80800 |
| WF Hood R nr Dee | MAY-JUL | 64 | 79 | 89 | 129% | 99 | 114 | 69 |
| | MAY-SEP | 82 | 98 | 109 | 121% | 119 | 135 | 90 |
| Sandy R nr Marmot | MAY-JUL | 163 | 210 | 240 | 121% | 270 | 315 | 198 |
| | MAY-SEP | 205 | 255 | 290 | 118% | 325 | 375 | 245 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

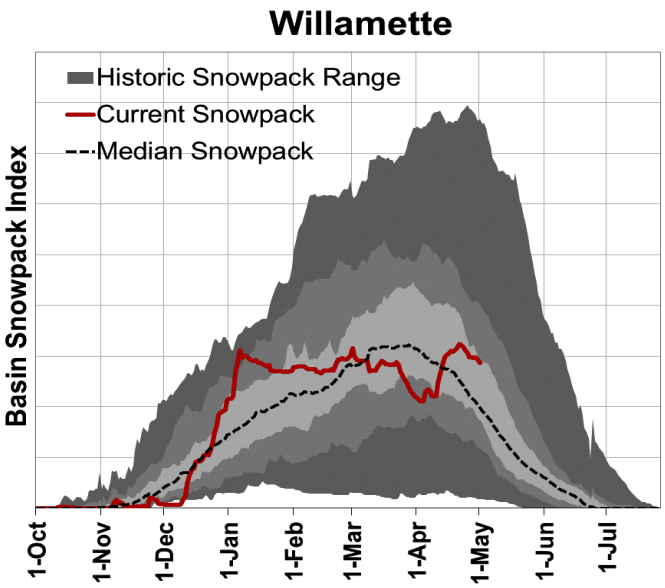
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Clear Lake | 3 | 3 | 5 | 58% | 13 |

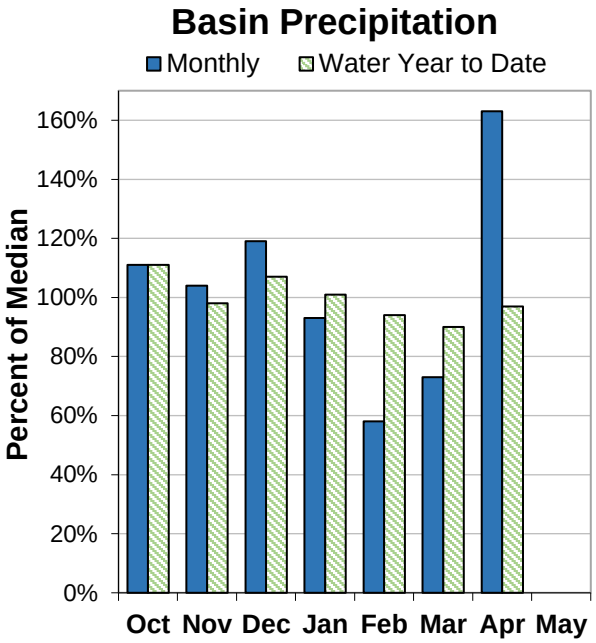
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Hood-Sandy-Lower Deschutes | 9 | 173% | 99% |
| Middle Columbia-Hood | 6 | 161% | 147% |
| Lower Deshcutes | 6 | 137% | 76% |
| Lower Columbia-Sandy | 7 | 159% | 120% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| High Prairie | SC | 6080 | | | | | |
| Bald Peter | SC | 5600 | | | 27.2 | 0.0 | |
| Mt Hood Test Site | SNOTEL | 5370 | 138 | 54.0 | 53.8 | 59.9 | 100% |
| Racing Creek | SC | 5160 | | | 9.4 | 0.0 | |
| Red Hill | SNOTEL | 4410 | 112 | 67.4 | 40.4 | 49.5 | 167% |
| Mill Creek Meadow | SC | 4400 | | | | | |
| Beaver Creek #2 | SC | 4220 | | | 0.3 | | |
| Beaver Creek #1 | SC | 4210 | | | 9.2 | | |
| Mud Ridge | SNOTEL | 4070 | 56 | 27.9 | 16.3 | 18.2 | 171% |
| Clear Lake | SNOTEL | 3810 | 25 | 10.1 | 1.0 | 3.6 | 1010% |
| Blazed Alder | SNOTEL | 3650 | 84 | 37.1 | 20.8 | 24.1 | 178% |
| Clackamas Lake | SNOTEL | 3400 | 15 | 5.6 | 0.0 | 0.0 | |
| Greenpoint | SNOTEL | 3310 | 32 | 15.6 | 0.6 | 5.6 | 2600% |
| North Fork | SNOTEL | 3060 | 71 | 29.0 | 10.8 | 16.8 | 269% |
| South Fork Bull Run | SNOTEL | 2690 | 5 | 2.2 | 0.0 | 0.0 | |

# Willamette Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 145% of median. This is significantly higher than last month when the basin snowpack was 69% of median.

### PRECIPITATION

April precipitation was 161% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 97% of median.

### RESERVOIR

As of May 1, storage at major reservoirs in the basin ranges from 30% of median at Fall Creek Reservoir to 146% of median at Foster Reservoir.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 87% to 117% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect above median to below median streamflows this spring and summer.

# Willamette Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Willamette R at Salem[1] | MAY-JUN | 1040 | 1700 | 2010 | 97% | 2310 | 2980 | 2080 |
| | MAY-SEP | 1650 | 2410 | 2760 | 95% | 3100 | 3870 | 2900 |
| Clackamas R at Estacada | MAY-JUL | 305 | 385 | 440 | 117% | 500 | 580 | 375 |
| | MAY-SEP | 415 | 500 | 555 | 117% | 615 | 700 | 475 |
| McKenzie R bl Trail Bridge[1] | MAY-JUN | 90 | 112 | 122 | 92% | 132 | 154 | 133 |
| | MAY-SEP | 198 | 230 | 245 | 91% | 260 | 290 | 270 |
| South Santiam R at Waterloo[1] | MAY-JUN | 82 | 195 | 245 | 91% | 300 | 410 | 270 |
| | MAY-SEP | 121 | 245 | 305 | 87% | 360 | 485 | 350 |
| Clackamas R ab Three Lynx | MAY-JUL | 240 | 285 | 320 | 121% | 355 | 405 | 265 |
| | MAY-SEP | 330 | 380 | 415 | 115% | 450 | 500 | 360 |
| Lookout Point Reservoir Inflow[1] | MAY-JUN | 210 | 330 | 385 | 97% | 435 | 555 | 395 |
| | MAY-SEP | 350 | 490 | 550 | 101% | 610 | 750 | 545 |
| North Santiam R at Mehama[1] | MAY-JUN | 220 | 335 | 390 | 105% | 445 | 560 | 370 |
| | MAY-SEP | 345 | 490 | 560 | 101% | 625 | 770 | 555 |
| Hills Creek Reservoir Inflow[1] | MAY-JUN | 90 | 133 | 152 | 106% | 172 | 215 | 144 |
| | MAY-SEP | 153 | 200 | 225 | 110% | 245 | 295 | 205 |
| Green Peter Lake Inflow[1] | MAY-JUN | 65 | 115 | 137 | 102% | 159 | 210 | 134 |
| | MAY-SEP | 83 | 140 | 166 | 98% | 192 | 250 | 170 |
| Detroit Lake Inflow[1] | MAY-JUN | 177 | 255 | 290 | 112% | 325 | 400 | 260 |
| | MAY-SEP | 305 | 395 | 435 | 106% | 475 | 565 | 410 |
| Cougar Lake Inflow[1] | MAY-JUN | 53 | 89 | 106 | 99% | 122 | 159 | 107 |
| | MAY-SEP | 93 | 135 | 155 | 101% | 174 | 215 | 154 |
| Foster Lake Inflow[1] | MAY-JUN | 64 | 178 | 230 | 92% | 280 | 395 | 250 |
| | MAY-SEP | 103 | 225 | 285 | 92% | 340 | 465 | 310 |
| McKenzie R nr Vida[1] | MAY-JUN | 300 | 420 | 470 | 96% | 525 | 645 | 490 |
| | MAY-SEP | 605 | 750 | 815 | 96% | 880 | 1020 | 845 |
| Blue Lake Inflow[1] | MAY-JUN | 7 | 28 | 38 | 97% | 47 | 68 | 39 |
| | MAY-SEP | 11 | 33 | 43 | 96% | 53 | 75 | 45 |
| Oak Grove Fk ab Powerplant | MAY-JUL | 75 | 85 | 92 | 115% | 99 | 109 | 80 |
| | MAY-SEP | 112 | 126 | 135 | 112% | 144 | 158 | 121 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume.
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

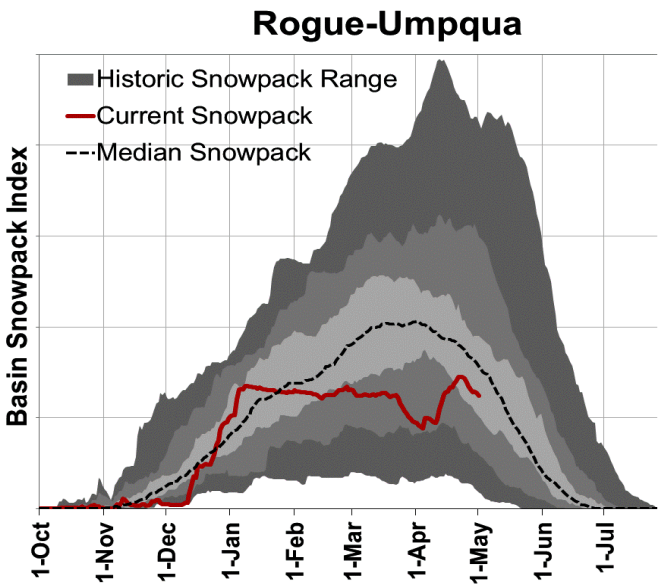
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Blue River | 76 | 62 | 76 | 100% | 82 |
| Cottage Grove | 27 | 20 | 27 | 100% | 32 |
| Lookout Point | 307 | 264 | 386 | 79% | 433 |
| Foster | 33 | 45 | 23 | 146% | 46 |
| Henry Hagg Lake | 53 | 53 | 53 | 100% | 53 |
| Cougar | 47 | 125 | 159 | 30% | 175 |
| Detroit | 412 | 343 | 421 | 98% | 427 |
| Green Peter | 342 | 348 | 389 | 88% | 403 |
| Dorena | 61 | 48 | 61 | 100% | 72 |
| Timothy Lake | 62 | 61 | 60 | 102% | 64 |
| Hills Creek | 220 | 255 | 254 | 86% | 279 |
| Fall Creek | 33 | 82 | 108 | 30% | 116 |
| Dexter | 25 | 26 | 25 | 98% | |
| Fern Ridge | 91 | 65 | 96 | 95% | 97 |

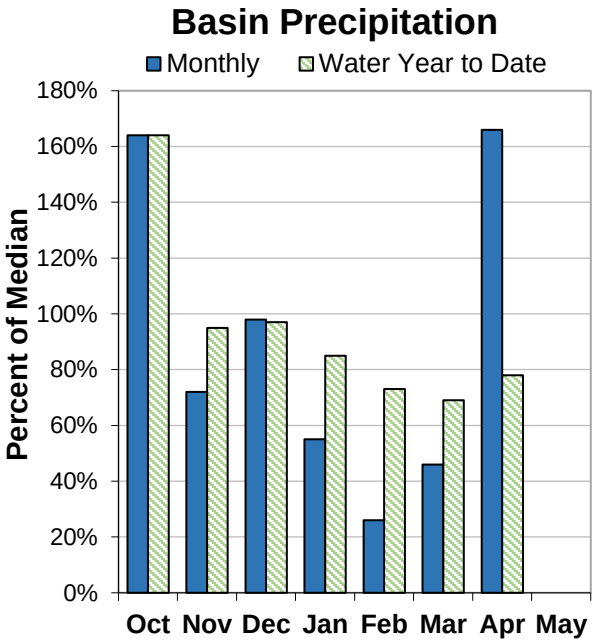
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Willamette | 21 | 145% | 97% |
| South Santiam | 3 | 232% | 133% |
| North Santiam | 4 | 244% | 133% |
| Middle Fork Willamette | 7 | 117% | 92% |
| McKenzie | 7 | 119% | 92% |
| Clackamas | 4 | 305% | 126% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Summit Lake | SNOTEL | 5610 | 87 | 36.4 | 40.4 | 34.9 | 90% |
| Irish Taylor | SNOTEL | 5540 | 80 | 30.2 | 32.8 | 30.2 | 92% |
| Cascade Summit | SNOTEL | 5100 | 63 | 25.4 | 22.2 | 19.6 | 114% |
| Roaring River | SNOTEL | 4950 | 51 | 23.1 | 18.4 | 19.8 | 126% |
| Holland Meadows | SNOTEL | 4930 | 29 | 21.4 | 9.2 | 4.4 | 233% |
| Hogg Pass | SNOTEL | 4790 | 30 | 13.1 | 8.0 | 7.0 | 164% |
| Mckenzie | SNOTEL | 4770 | 79 | 34.6 | 32.5 | 27.3 | 106% |
| Bear Grass | SNOTEL | 4720 | 101 | 52.3 | | 44.7 | |
| Beaver Creek #2 | SC | 4220 | | | 0.3 | | |
| Salt Creek Falls | SNOTEL | 4220 | 37 | 18.9 | 10.3 | 13.7 | 183% |
| Beaver Creek #1 | SC | 4210 | | | 9.2 | | |
| Mud Ridge | SNOTEL | 4070 | 56 | 27.9 | 16.3 | 18.2 | 171% |
| Little Meadows | SNOTEL | 4020 | 70 | 32.7 | 17.4 | 23.2 | 188% |
| Clear Lake | SNOTEL | 3810 | 25 | 10.1 | 1.0 | 3.6 | 1010% |
| Santiam Jct. | SNOTEL | 3740 | 0 | 0.1 | 0.0 | 0.0 | |
| Daly Lake | SNOTEL | 3690 | 8 | 3.9 | 0.0 | 0.0 | |
| Marys Peak (Rev.) | SC | 3580 | | | | | |
| Jump Off Joe | SNOTEL | 3520 | 10 | 3.8 | 0.0 | 0.0 | |
| Peavine Ridge | SNOTEL | 3420 | 16 | 9.2 | 0.0 | 0.0 | |
| Clackamas Lake | SNOTEL | 3400 | 15 | 5.6 | 0.0 | 0.0 | |
| Smith Ridge | SNOTEL | 3270 | 0 | 0.0 | | 0.0 | |
| Saddle Mountain | SNOTEL | 3110 | 0 | 0.0 | 0.0 | 0.0 | |
| Railroad Overpass | SNOTEL | 2680 | 0 | 0.0 | 0.0 | 0.0 | |
| Marion Forks | SNOTEL | 2590 | 13 | 5.7 | 0.0 | 0.0 | |
| Seine Creek | SNOTEL | 2060 | 0 | 0.0 | 0.0 | 0.0 | |
| Miller Woods | SNOTEL | 420 | 0 | 0.0 | 0.0 | 0.0 | |

# Rogue and Umpqua Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 71% of median. This is higher than last month when the basin snowpack was 44% of median.

### PRECIPITATION

April precipitation was 173% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 78% of median.

### RESERVOIR

Reservoir storage across the basin is currently well below median. As of May 1, storage at major reservoirs in the basin ranges from 19% of median at Emigrant Lake to 67% of median at Lost Creek.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 95% to 56% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect near median to well below median streamflows this spring and summer.

# Rogue-Umpqua Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Lost Creek Lk Inflow[2] | MAY-JUL | 186 | 235 | 265 | 79% | 295 | 345 | 335 |
| | MAY-SEP | 280 | 335 | 375 | 82% | 410 | 465 | 455 |
| Sucker Ck bl Ltl Grayback Ck nr Holland | MAY-JUL | 3 | 12 | 18 | 75% | 24 | 33 | 24 |
| | MAY-SEP | 5 | 14 | 20 | 71% | 27 | 36 | 28 |
| Cow Ck ab Galesville Reservoir | MAY-JUL | 0 | 3 | 5 | 78% | 7 | 10 | 6 |
| | MAY-SEP | 1 | 4 | 6 | 79% | 8 | 11 | 8 |
| Applegate Lake Inflow[2] | MAY-JUL | 11 | 25 | 35 | 64% | 45 | 59 | 55 |
| | MAY-SEP | 11 | 25 | 35 | 56% | 45 | 60 | 62 |
| Rogue R at Grants Pass[2] | MAY-JUL | 220 | 285 | 325 | 84% | 370 | 435 | 385 |
| | MAY-SEP | 325 | 390 | 435 | 84% | 480 | 545 | 515 |
| North Umpqua R at Winchester | MAY-JUL | 235 | 345 | 420 | 93% | 495 | 605 | 450 |
| | MAY-SEP | 330 | 450 | 530 | 95% | 610 | 725 | 555 |
| Illinois R nr Kerby | MAY-JUL | -2 | 29 | 50 | 69% | 71 | 103 | 72 |
| | MAY-SEP | 1 | 33 | 54 | 69% | 76 | 108 | 78 |
| South Umpqua R nr Brockway | MAY-JUL | 6 | 68 | 131 | 82% | 154 | 215 | 160 |
| | MAY-SEP | 17 | 81 | 145 | 80% | 168 | 230 | 182 |
| Rogue R at Raygold[2] | MAY-JUL | 205 | 275 | 325 | 88% | 370 | 440 | 370 |
| | MAY-SEP | 305 | 385 | 440 | 89% | 495 | 575 | 495 |
| South Umpqua R at Tiller | MAY-JUL | 28 | 55 | 74 | 84% | 93 | 120 | 88 |
| | MAY-SEP | 34 | 61 | 80 | 83% | 99 | 126 | 96 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

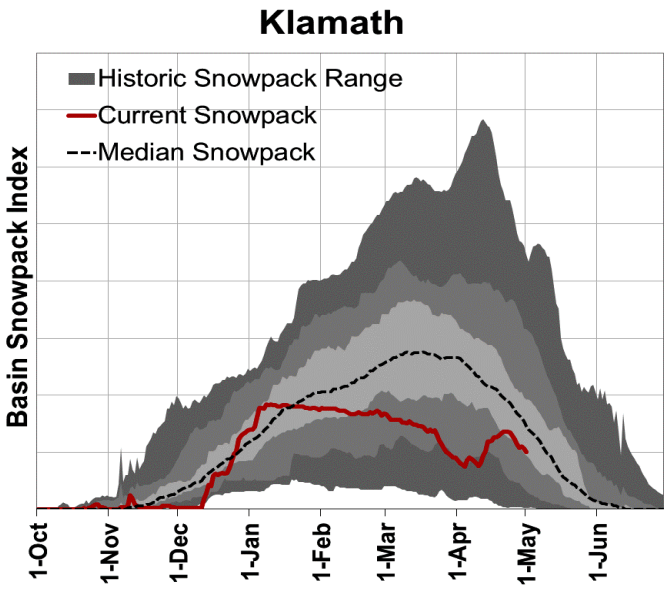
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Lost Creek | 204 | 239 | 303 | 67% | 315 |
| Fish Lake | 3 | 4 | 5 | 65% | 8 |
| Emigrant Lake | 7 | 12 | 38 | 19% | 39 |
| Applegate | 37 | 42 | 66 | 57% | 75 |

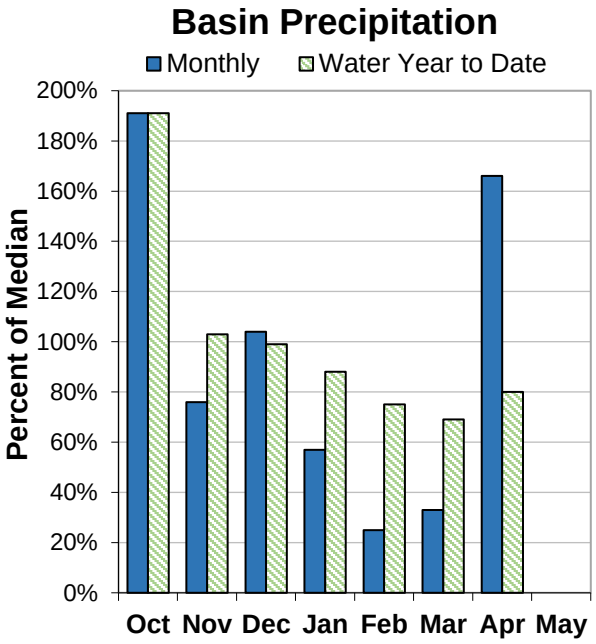
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Rogue-Umpqua | 21 | 71% | 61% |
| Upper Rogue | 8 | 78% | 57% |
| South Umpqua | 7 | 421% | 125% |
| North Umpqua | 4 | 99% | 88% |
| Middle Rogue | 7 | 47% | 51% |
| Applegate | 5 | 48% | 56% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Park H.q. Rev | SC | 6570 | 97 | 41.2 | 59.5 | 41.4 | 69% |
| Caliban (Alt.) | SC | 6500 | 44 | 16.4 | 29.8 | 20.0 | 55% |
| Mount Ashland Switchback | SC | 6430 | 30 | 11.3 | 29.6 | 13.0 | 38% |
| Ski Bowl Road | SC | 6070 | 18 | 7.3 | 19.6 | 7.3 | 37% |
| Big Red Mountain | SNOTEL | 6050 | 36 | 14.9 | 24.2 | 17.8 | 62% |
| Annie Springs | SNOTEL | 6010 | 68 | 26.3 | 35.0 | 24.0 | 75% |
| Fourmile Lake | SNOTEL | 5970 | 39 | 16.3 | 20.2 | 10.1 | 81% |
| Cold Springs Camp | SNOTEL | 5940 | 14 | 5.8 | 17.4 | 0.0 | 33% |
| Sevenmile Marsh | SNOTEL | 5700 | 46 | 20.2 | 22.7 | 12.3 | 89% |
| Summit Lake | SNOTEL | 5610 | 87 | 36.4 | 40.4 | 34.9 | 90% |
| Diamond Lake | SNOTEL | 5280 | 0 | 0.1 | 0.0 | 0.0 | |
| Billie Creek Divide | SNOTEL | 5280 | 22 | 11.6 | 8.2 | 4.3 | 141% |
| Bigelow Camp | SNOTEL | 5130 | 0 | 0.0 | 0.0 | 0.0 | |
| Beaver Dam Creek | SC | 5120 | | | 0.0 | 0.0 | |
| Althouse #3 Rev | SC | 4970 | 4 | 1.6 | | | |
| King Mountain 1 | SC | 4760 | 7 | 1.7 | 0.0 | 0.3 | |
| Deadwood Junction | SC | 4660 | | | 0.0 | 0.0 | |
| Fish Lk. | SNOTEL | 4660 | 8 | 3.0 | 0.0 | 0.0 | |
| Howard Prairie | SNOTEL | 4580 | 0 | 0.0 | | 0.0 | |
| Howard Prairie | SC | 4580 | | | 0.0 | 0.0 | |
| Siskiyou Summit Rev. #2 | SC | 4560 | | | | | |
| Red Butte 1 | SC | 4460 | 19 | 6.0 | 2.4 | 2.7 | 250% |
| King Mountain | SNOTEL | 4340 | 0 | 0.1 | 0.0 | 0.0 | |
| North Umpqua | SC | 4200 | | | 0.0 | | |
| Red Butte 2 | SC | 4050 | 4 | 1.2 | | 0.0 | |
| Trap Creek | SC | 3830 | | | 0.0 | | |
| Silver Burn | SC | 3680 | 6 | 2.3 | 0.0 | 0.0 | |
| King Mountain 3 | SC | 3680 | 0 | 0.0 | 0.0 | 0.0 | |
| Red Butte 3 | SC | 3500 | 0 | 0.0 | | 0.0 | |
| Toketee Airstrip | SNOTEL | 3240 | 0 | 0.0 | 0.0 | 0.0 | |
| King Mountain 4 | SC | 3050 | 0 | 0.0 | 0.0 | 0.0 | |
| Red Butte 4 | SC | 3000 | 0 | 0.0 | | 0.0 | |

# Klamath Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 67% of median. This is significantly higher than last month when the basin snowpack was 35% of median.

### PRECIPITATION

April precipitation was 169% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 78% of median.

### RESERVOIR

Reservoir storage across the basin is currently well below median. As of May 1, storage at major reservoirs in the basin ranges from 21% of median at Howard Prairie Reservoir to 72% of median at Upper Klamath Lake.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 65% to 76% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect well below median streamflows this spring and summer.

# Klamath Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Upper Klamath Lake Inflow[2] | MAY-SEP | 103 | 146 | 168 | 65% | 192 | 250 | 260 |
| Williamson R bl Sprague R nr Chiloquin | MAY-SEP | 110 | 139 | 159 | 76% | 179 | 210 | 210 |
| Sprague R nr Chiloquin | MAY-SEP | 44 | 59 | 71 | 66% | 84 | 105 | 108 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume.
1) 90% and 10% exceedance probabilities are actually 95% and 5%
2) Forecasts are for unimpaired flows. Actual flow will be dependent on management of upstream reservoirs and diversions.

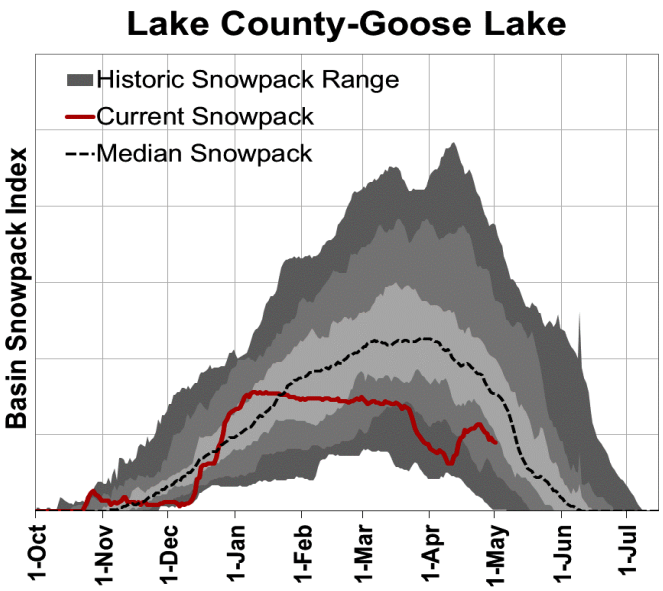
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Hyatt Prairie | 3 | 4 | 12 | 25% | 16 |
| Gerber | 15 | 27 | 66 | 23% | 94 |
| Fourmile Lake | 4 | 4 | 8 | 43% | 16 |
| Upper Klamath Lake | 336 | 322 | 466 | 72% | 524 |
| Clear Lake | 64 | 113 | 174 | 37% | 513 |
| Howard Prairie | 9 | 6 | 42 | 21% | 62 |

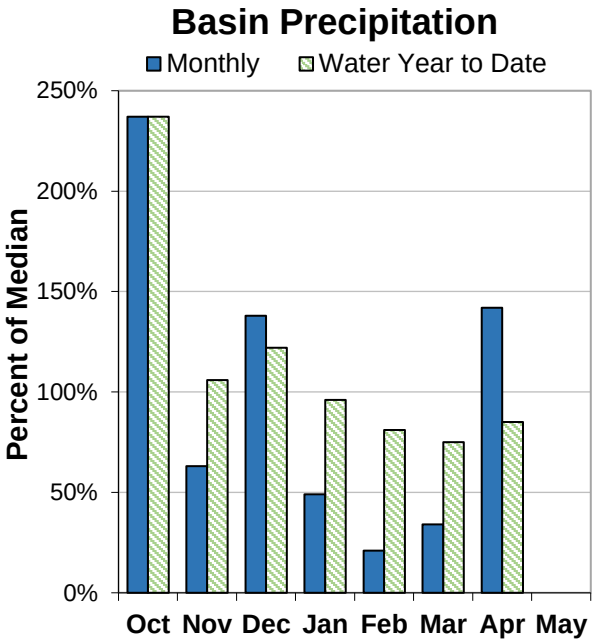
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Klamath | 20 | 67% | 47% |
| Williamson | 6 | 75% | 67% |
| Upper Klamath lake | 8 | 78% | 55% |
| Sprague | 7 | 4% | 0% |
| Lost | 4 | 6% | 0% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Summer Rim | SNOTEL | 7080 | 0 | 0.3 | 9.8 | 0.0 | 3% |
| Swan Lake Mtn | SNOTEL | 6830 | 0 | 0.8 | 14.0 | 0.0 | 6% |
| Park H.q. Rev | SC | 6570 | 97 | 41.2 | 59.5 | 41.4 | 69% |
| Crazyman Flat | SNOTEL | 6180 | 0 | 0.0 | 1.2 | 0.0 | 0% |
| Annie Springs | SNOTEL | 6010 | 68 | 26.3 | 35.0 | 24.0 | 75% |
| Finley Corrals AM | SC | 6000 | 0 | 0.0 | 4.0 | 0.0 | 0% |
| Fourmile Lake | SNOTEL | 5970 | 39 | 16.3 | 20.2 | 10.1 | 81% |
| Cold Springs Camp | SNOTEL | 5940 | 14 | 5.8 | 17.4 | 0.0 | 33% |
| Strawberry | SNOTEL | 5770 | 0 | 0.0 | 0.0 | 0.0 | |
| Cox Flat AM | SC | 5750 | 0 | 0.0 | | 0.0 | |
| Silver Creek | SNOTEL | 5740 | 0 | 0.0 | 0.0 | 0.0 | |
| Quartz Mountain | SNOTEL | 5720 | 0 | 0.0 | 0.0 | 0.0 | |
| Sevenmile Marsh | SNOTEL | 5700 | 46 | 20.2 | 22.7 | 12.3 | 89% |
| State Line Am (Ca) | SC | 5690 | 0 | 0.0 | | 0.0 | |
| State Line | SNOTEL | 5680 | 0 | 0.0 | | 0.0 | |
| Sycan Flat AM | SC | 5580 | | | | | |
| Sun Pass | SNOTEL | 5400 | 10 | 5.5 | 3.4 | 0.0 | 162% |
| Diamond Lake | SNOTEL | 5280 | 0 | 0.1 | 0.0 | 0.0 | |
| Billie Creek Divide | SNOTEL | 5280 | 22 | 11.6 | 8.2 | 4.3 | 141% |
| Crowder Flat | SNOTEL | 5170 | 0 | 0.0 | 0.0 | 0.0 | |
| Beaver Dam Creek | SC | 5120 | | | 0.0 | 0.0 | |
| Taylor Butte | SNOTEL | 5030 | 0 | 0.0 | 0.0 | 0.0 | |
| Dog Hollow AM | SC | 4920 | | | | | |
| Gerber Reservoir | SNOTEL | 4890 | 0 | 0.0 | 0.0 | 0.0 | |
| Chemult Alternate | SNOTEL | 4850 | 0 | 0.0 | 0.0 | 0.0 | |
| Deadwood Junction | SC | 4660 | | | 0.0 | 0.0 | |
| Fish Lk. | SNOTEL | 4660 | 8 | 3.0 | 0.0 | 0.0 | |
| Howard Prairie | SNOTEL | 4580 | 0 | 0.0 | | 0.0 | |
| Howard Prairie | SC | 4580 | | | 0.0 | 0.0 | |

# Lake County and Goose Lake Basins

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 49% of median. This is higher than last month when the basin snowpack was 29% of median.

### PRECIPITATION

April precipitation was 140% of median. Precipitation since the beginning of the water year (October 1 -May 1) has been 85% of median.

### RESERVOIR

Reservoir storage across the basin is currently well below average. As of May 1, storage at Cottonwood Reservoir is at 40% of average.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 49% to 81% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should prepare for significantly reduced water supplies in the coming summer.

# Lake County-Goose Lake Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Chewaucan R nr Paisley | MAY-JUL | 2 | 11 | 20 | 47% | 25 | 36 | 43 |
| | MAY-SEP | 2 | 13 | 23 | 49% | 28 | 39 | 47 |
| Twentymile Ck nr Adel | MAY-JUL | 1 | 2 | 6 | 76% | 10 | 15 | 8 |
| | MAY-SEP | 1 | 2 | 6 | 76% | 10 | 16 | 8 |
| Deep Ck ab Adel | MAY-JUL | 4 | 16 | 25 | 76% | 33 | 45 | 33 |
| | MAY-SEP | 5 | 18 | 26 | 76% | 35 | 47 | 34 |
| Honey Ck nr Plush | MAY-JUL | 1 | 2 | 5 | 82% | 7 | 11 | 6 |
| | MAY-SEP | 1 | 2 | 5 | 81% | 8 | 11 | 6 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume

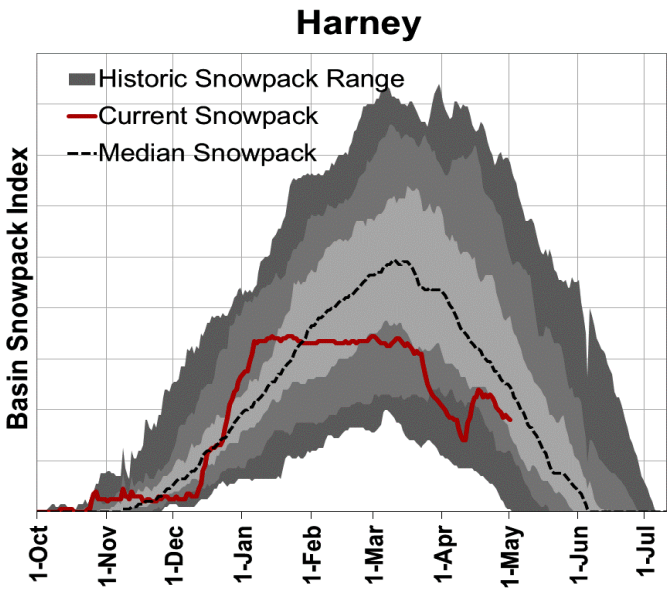
| Reservoir Storage | Current (KAF) | Last Year (KAF) | Median (KAF) | % of Median | Usable Capacity (KAF) |
|---|---|---|---|---|---|
| Cottonwood | 4 | 2 | 9 | 40% | 9 |
| Drews | 16 | 11 | 49 | 33% | 64 |

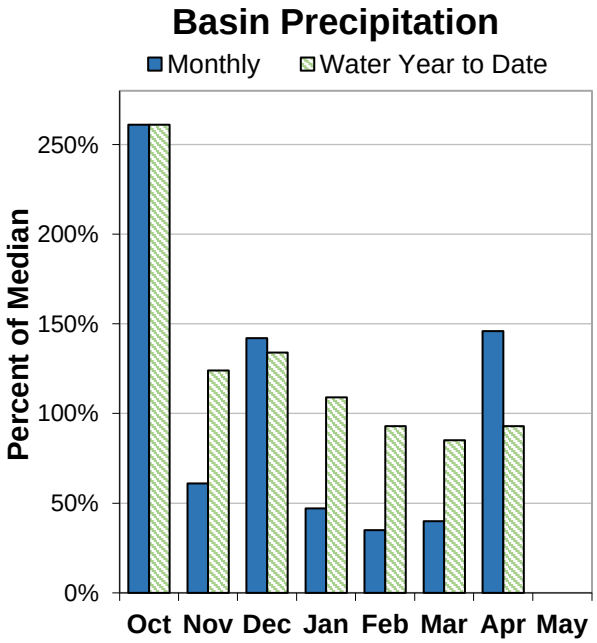
| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Lake County-Goose Lake | 8 | 49% | 29% |
| Warner Lakes | 1 | 82% | 57% |
| Summer Lake | 2 | 3% | 0% |
| Lake Abert | 2 | 2% | 17% |
| Goose lake | 5 | 62% | 37% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Dismal Swamp | SNOTEL | 7360 | 42 | 21.4 | 26.2 | 14.2 | 82% |
| Summer Rim | SNOTEL | 7080 | 0 | 0.3 | 9.8 | 0.0 | 3% |
| Cedar Pass | SC | 7050 | | | | 7.0 | |
| Cedar Pass | SNOTEL | 7030 | 9 | 5.2 | 10.1 | 0.3 | 51% |
| Barley Camp AM | SC | 6890 | | | | | |
| Patton Meadows AM | SC | 6800 | 5 | 2.3 | 10.0 | 1.0 | 23% |
| Sherman Valley AM | SC | 6640 | 1 | 0.5 | | 0.0 | |
| Bear Flat Meadow AM | SC | 6580 | 0 | 0.0 | | 0.0 | |
| Little Bally Mt. - Aerial Marker | SC | 6580 | | | | | |
| Colvin Creek AM | SC | 6520 | | | | | |
| Hart Mountain AM | SC | 6430 | 0 | 0.0 | | 0.0 | |
| Rogger Meadow AM | SC | 6360 | 5 | 2.4 | | 0.0 | |
| Finley Corrals AM | SC | 6000 | 0 | 0.0 | 4.0 | 0.0 | 0% |
| Camas Creek #3 | SC | 5860 | | | 3.9 | 3.0 | |
| Strawberry | SNOTEL | 5770 | 0 | 0.0 | 0.0 | 0.0 | |
| Cox Flat AM | SC | 5750 | 0 | 0.0 | | 0.0 | |
| Silver Creek | SNOTEL | 5740 | 0 | 0.0 | 0.0 | 0.0 | |
| Quartz Mountain | SNOTEL | 5720 | 0 | 0.0 | 0.0 | 0.0 | |
| State Line Am (Ca) | SC | 5690 | 0 | 0.0 | | 0.0 | |
| State Line | SNOTEL | 5680 | 0 | 0.0 | | 0.0 | |
| Sycan Flat AM | SC | 5580 | | | | | |

# Harney Basin

**May 1, 2022**




## Summary of Water Supply Conditions

### SNOWPACK

As of May 1, the basin snowpack was 74% of median. This is significantly higher than last month when the basin snowpack was 44% of median.

### PRECIPITATION

April precipitation was 143% of median. Precipitation since the beginning of the water year (October 1 - May 1) has been 93% of median.

### STREAMFLOW FORECAST

The May through September streamflow forecasts in the basin range from 61% to 88% of median. Overall, forecasts increased significantly from last month's report. Water managers in the basin should expect below median to well below median streamflows this spring and summer.

# Harney Summary for May 1, 2022

| Forecast Exceedance Probabilities for Risk Assessment* | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | <----Drier-----Future Conditions-----Wetter----> | | | | | | |
| Streamflow Forecasts | Forecast Period | 90% (KAF) | 70% (KAF) | 50% (KAF) | % Median | 30% (KAF) | 10% (KAF) | 30yr Median (KAF) |
| Silvies R nr Burns | MAY-JUL | 5 | 9 | 13 | 59% | 18 | 25 | 22 |
| | MAY-SEP | 6 | 10 | 14 | 61% | 19 | 27 | 23 |
| Trout Ck nr Denio | MAY-JUL | 0 | 1 | 3 | 87% | 4 | 7 | 3 |
| | MAY-SEP | 0 | 1 | 3 | 88% | 4 | 7 | 3 |
| Donner Und Blitzen R nr Frenchglen | MAY-JUL | 8 | 21 | 31 | 72% | 40 | 53 | 43 |
| | MAY-SEP | 11 | 25 | 34 | 71% | 44 | 58 | 48 |

* 90%, 70%, 50%, 30%, 10% exceedence probabilities are the chance that observed streamflow volume will exceed the forecasted volume

| Snowpack Summary by Basin | # of Sites | % Median | Last Yr % Median |
|---|---|---|---|
| Harney | 11 | 74% | 59% |
| Upper Quinn | 4 | 87% | 70% |
| Silvies | 4 | 56% | 6% |
| Silver | 1 | 56% | 6% |
| Harney-Malheur Lakes | 0 | | |
| Guano | 1 | | |
| Donner und Blitzen | 2 | 70% | 59% |
| Alvord Lake | 2 | 90% | 77% |

| Basin Snowpack Measurement Sites | Network | Elevation (ft) | Snow Depth (in) | Snow Water Equivalent (in) | | | |
|---|---|---|---|---|---|---|---|
| | | | | Current SWE (in) | Median (in) | Last Yr SWE (in) | % of Median |
| Granite Peak | SNOTEL | 8503 | 32 | 14.1 | 16.2 | 11.4 | 87% |
| Trout Creek AM | SC | 7890 | 10 | 4.9 | | 6.7 | |
| Fish Creek | SNOTEL | 7660 | 45 | 23.6 | 26.2 | 20.3 | 90% |
| Summit Lk | SNOTEL | 7615 | 3 | 0.4 | | 0.0 | |
| Govt Corrals AM | SC | 7400 | 0 | 0.0 | | 8.4 | |
| Oregon Canyon AM | SC | 7050 | | | | | |
| Silvies | SNOTEL | 6990 | 0 | 0.5 | 8.2 | 0.0 | 6% |
| Pueblo Summit AM | SC | 6970 | | | | | |
| Buckskin Lower | SNOTEL | 6930 | 0 | 0.0 | 0.0 | 0.0 | |
| Bald Mt. | SC | 6720 | 0 | 0.0 | | 0.0 | |
| V Lake AM | SC | 6600 | 1 | 0.5 | | 0.0 | |
| Louse Canyon AM | SC | 6530 | 0 | 0.0 | | 0.0 | |
| Hart Mountain AM | SC | 6430 | 0 | 0.0 | | 0.0 | |
| Lamance Creek | SNOTEL | 6395 | 0 | 0.0 | 0.0 | 0.0 | |
| Quinn Ridge AM | SC | 6270 | 0 | 0.0 | | 0.0 | |
| Disaster Peak | SNOTEL | 6260 | 0 | 0.0 | 0.0 | 0.0 | |
| Snow Mountain | SNOTEL | 6230 | 3 | 1.9 | 3.4 | 0.2 | 56% |
| Sheldon | SNOTEL | 5865 | 0 | 0.0 | 0.0 | 0.0 | |
| Buck Pasture AM | SC | 5740 | | | | | |
| Call Meadows AM | SC | 5380 | 0 | 0.0 | | 0.0 | |
| Rock Springs | SNOTEL | 5290 | 0 | 0.0 | 0.0 | 0.0 | |
| Starr Ridge | SNOTEL | 5250 | 0 | 0.0 | 0.0 | 0.0 | |
| Lake Creek R.S. | SNOTEL | 5240 | 0 | 0.0 | 0.0 | 0.0 | |
| Buckskin Lake AM | SC | 5190 | 0 | 0.0 | | 0.0 | |

# Basin Outlook Reports: How Forecasts Are Made

## Federal – State – Private
## Cooperative Snow Surveys

*For more water supply and resource management information, contact:*

**USDA, Natural Resources Conservation Service**
**Snow Survey Office**
**1201 NE Lloyd Suite 900**
**Portland, OR 97232**
**Phone: (503) 414-3271**
**Web site** ***https://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/***

Most of the annual streamflow in the western United States originates as snowfall that has accumulated in the mountains during the winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Measurements of snow water equivalent at selected manual snow courses and automated SNOTEL sites, along with precipitation, antecedent streamflow, and indices of the El Niño / Southern Oscillation are used in computerized statistical and simulation models to prepare runoff forecasts. Unless otherwise specified, all forecasts are for flows that would occur naturally without any upstream influences

Forecasts of any kind, of course, are not perfect. Streamflow forecast uncertainty arises from three primary sources: (1) uncertain knowledge of future weather conditions, (2) uncertainty in the forecasting procedure, and (3) errors in the data. The forecast, therefore, must be interpreted not as a single value but rather as a range of values with specific probabilities of occurrence. The middle of the range is expressed by the 50% exceedance probability forecast, for which there is a 50% chance that the actual flow will be above, and a 50% chance that the actual flow will be below, this value. To describe the expected range around this 50% value, four other forecasts are provided, two smaller values (90% and 70% exceedance probability) and two larger values (30%, and 10% exceedance probability). For example, there is a 90% chance that the actual flow will be more than the 90% exceedance probability forecast. The others can be interpreted similarly.

The wider the spread among these values, the more uncertainty is in the forecast. As the season progresses, forecasts become more accurate, primarily because a greater portion of the future weather conditions become known; this is reflected by a narrowing of the range around the 50% exceedance probability forecast. Users should take this uncertainty into consideration when making operational decisions by selecting forecasts corresponding to the level of risk they are willing to assume about the amount of water to be expected. If users anticipate receiving a lesser supply of water, or if they wish to increase their chances of having an adequate supply of water for their operations, they may want to base their decisions on the 90% or 70% exceedance probability forecasts, or something in between. On the other hand, if users are concerned about receiving too much water (for example, threat of flooding), they may want to base their decisions on the 30% or 10% exceedance probability forecasts, or something in between. Regardless of the forecast value users choose for operations, they should be prepared to deal with either more or less water. Users should remember that even if the 90% exceedance probability forecast is used, there is still a 10% chance of receiving less than this amount. By using the exceedance probability information, users can easily determine the chances of receiving more or less water.

# Interpreting Water Supply Forecasts

Each month, five forecasts are issued for each forecast point and each forecast period. Unless otherwise specified, all streamflow forecasts are for streamflow volumes that would occur naturally without any upstream influences. Streamflow forecasts help users make risk-based decisions. Water users can select the forecast corresponding to the level of risk they are willing to accept in order to minimize the negative impacts of having more or less water than planned for. Users need to know what the different forecasts represent if they are to use the information correctly when making operational decisions. The following is an explanation of each of the forecasts.

***90 Percent Chance of Exceedance Forecast.*** There is a 90 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 10 percent chance that the actual streamflow volume will be less than this forecast value.

***70 Percent Chance of Exceedance Forecast.*** There is a 70 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 30 percent chance that the actual streamflow volume will be less than this forecast value.

***50 Percent Chance of Exceedance Forecast.*** There is a 50 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 50 percent chance that the actual streamflow volume will be less than this forecast value. Generally, this forecast is the middle of the range of possible streamflow volumes that can be produced given current conditions.

***30 Percent Chance of Exceedance Forecast.*** There is a 30 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 70 percent chance that the actual streamflow volume will be less than this forecast value.

***10 Percent Chance of Exceedance Forecast.*** There is a 10 percent chance that the actual streamflow volume will exceed this forecast value, and there is a 90 percent chance that the actual streamflow volume will be less than this forecast value.

*Note: There is still a 20 percent chance that actual streamflow volumes will fall either below the 90 percent exceedance forecast or above the 10 percent exceedance forecast.

These forecasts represent the uncertainty inherent in making streamflow predictions. This uncertainty may include sources such as: unknown future weather conditions, uncertainties associated with the various prediction methodologies, and the spatial coverage of the data network in a given basin. AF stands for acre-feet. Forecasted volumes of water are typically in thousands of acre-feet.

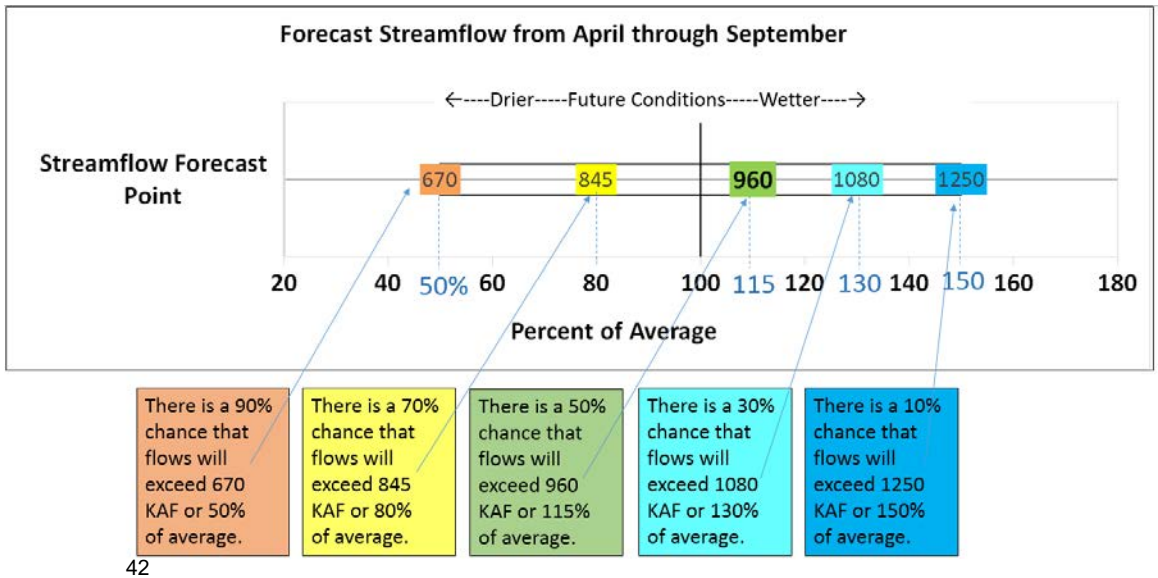
***30-Year Average.*** The 30-year average streamflow for each forecast period is provided for comparison. The average is based on data from 1981-2010. The % AVG. column compares the 50% chance of exceedance forecast to the 30-year average streamflow; values above 100% denote when the 50% chance of exceedance forecast would be greater than the 30-year average streamflow.

**To Decrease the Chance of Having Less Water than Planned for:** A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive less than this amount). To reduce the risk of having less water than planned for, users can base their operational decisions on one of the forecasts with a greater chance of being exceeded such as the 90 or 70 percent exceedance forecasts.

**To Decrease the Chance of Having More Water than Planned for:** A user might determine that making decisions based on a 50 percent chance of exceedance forecast is too much risk to take (there is still a 50% chance that the user will receive more than this amount). To reduce the risk of having more water than planned for, users can base their operational decisions on one of the forecasts with a lesser chance of being exceeded such as the 30 or 10 percent exceedance forecasts.

**<u>Graphical Representation of Streamflow Forecast Range:</u>**

*This type of graphic is used in the state-wide streamflow forecast summary*



## Using the Forecasts - an Example

***Using the 50 Percent Exceedance Forecast.*** Using the example forecasts shown here, there is a 50% chance that actual streamflow volume at the Mountain Creek near Mitchell will be less than 4.4 KAF between April 1 and Sept 30. There is also a 50% chance that actual streamflow volume will be greater than 4.4 KAF.

JOHN DAY BASIN
Streamflow Forecasts - February 1, 2013

| Forecast Point | Forecast Period | <<====== Drier ====== 90% (1000AF) | 70% (1000AF) | Future Conditions * Chance Of Exceeding * 50% (1000AF) | (% AVG.) | ======= Wetter =====>> 30% (1000AF) | 10% (1000AF) | 30-Yr Avg. (1000AF) |
|---|---|---|---|---|---|---|---|---|
| Strawberry Ck nr Prairie City | MAR-JUL | 5.0 | 6.6 | 7.6 | 89 | 8.6 | 10.2 | 8.5 |
| | APR-SEP | 5.2 | 6.8 | 7.9 | 90 | 9.0 | 10.6 | 8.8 |
| Mountain Ck nr Mitchell | FEB-JUL | 3.2 | 5.4 | 6.9 | 99 | 8.4 | 10.6 | 7.0 |
| | APR-SEP | 1.7 | 3.3 | 4.4 | 90 | 5.5 | 7.1 | 4.9 |

** 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.*

***Using the 90 and 70 Percent Exceedance Forecasts.*** If an unexpected shortage of water could cause problems (such as irrigated agriculture), users might want to plan on receiving 3.3 KAF (from the 70 percent exceedance forecast). There is a 30% chance of receiving *less* than 3.3 KAF.

Alternatively, if users determine the risk of using the 70 percent exceedance forecast is too great, then they might plan on receiving 1.7 KAF (from the **90** percent exceedance forecast). There is 10% chance of receiving less than 1.7 KAF.

***Using the 30 or 10 Percent Exceedance Forecasts.*** If an unexpected excess of water could cause problems (such as operating a flood control reservoir), users might plan on receiving 5.5 KAF (from the 30 percent exceedance forecast). There is a 30% chance of receiving *more* than 5.5 KAF.

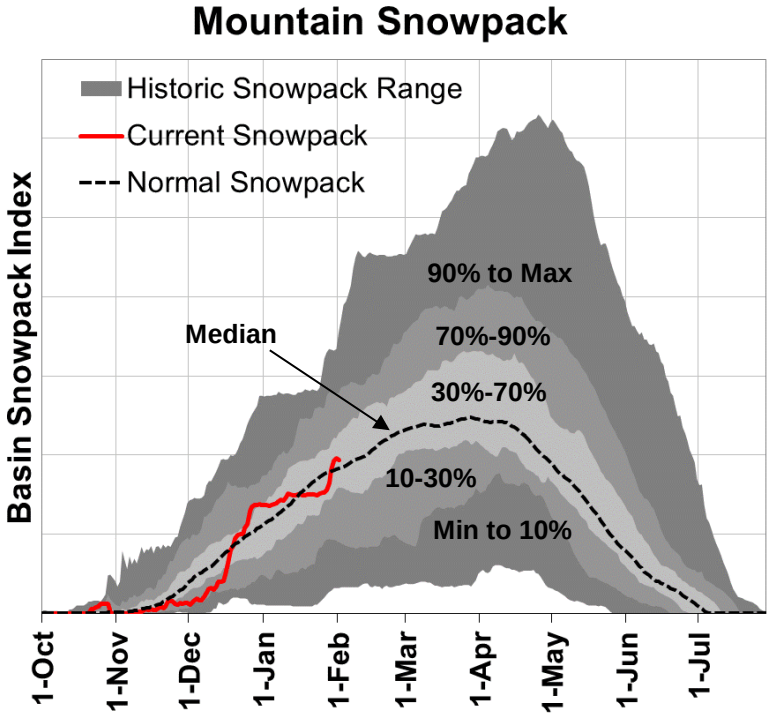
Alternatively, if users determine the risk of using the 30 percent exceedance forecast is too great, then they might plan on receiving 7.1 KAF (from the 10 percent exceedance forecast). There is a 10% chance of receiving more than 7.1 KAF.

# Interpreting Snowpack Plots

The basin snowpack plots display an index calculated using daily SNOTEL data for many sites in each basin. They show how the current year's snowpack data compares to historical data in the basin. The "Current Snowpack" line can be compared with the "Normal Snowpack" (median) line, as well as the historic range for the basin. This gives users important context about the current year and historic variability of snowpack in the basin.

The grey shaded areas represent different percentiles of the historical range of the snowpack index for each day. The dark grey shading indicates the extreme lows and highs in the SNOTEL record (minimum to the 10th percentile and the 90th percentile to maximum). The medium grey shading indicates the range from the 10th to 30th percentiles and the 70th to 90th percentiles. The light grey shading indicates the range between the 30th to 70th percentiles, while the median is the 50th percentile. A percentile is the value of the snowpack index below which the given percent of historical years fall. For instance, the 90th percentile line indicates that the snowpack index has been below this line for 90 percent of the years of record.

** Please note: These plots only use daily data from SNOTEL sites in the basin. Because snow course data is collected monthly, it cannot be included in these plots. The official snowpack percent of normal for the basin incorporates both SNOTEL and snow course data, so occasionally there might be slight discrepancies between the plot and official basin percent of normal (stated in basin summary below each plot).



USDA Natural Resources Conservation Service
1201 NE Lloyd Suite 900
Portland, OR 97232-1274

Official Business

This publication may be found online at:
**https://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/**

*Issued by*
**Terry Cosby, Chief**
**Natural Resources Conservation Service U.S. Department of Agriculture**

*Released by*
**Ron Alvarado, State Conservationist**
**Natural Resources Conservation Service**
**Portland, Oregon**

# IMPORTANT NOTICE

## WE ARE NOW OFFERING AN EMAIL SUBSCRIPTION FOR THE OREGON BASIN OUTLOOK REPORT

**If you would like to receive this document in PDF format via an email announcement, please sign up on our website to update your subscription preference.**

You will receive an email each month as soon as the report is published with a link to the PDF document on our website. By choosing this paperless option, you will receive your water supply information much faster and also help us save natural resources by reducing our hardcopy printing.

**If you would like to update your subscription, please sign up on our website by clicking the email updates link on the left hand side of the webpage:**
**Snow Survey Homepage:**
**https://www.nrcs.usda.gov/wps/portal/nrcs/main/or/snow/**